JEFF WEBER RARE BOOKS

1815 Oak Ave, Carlsbad CA 92008

Phone: 323 333 4140
weberbks@pacbell.net

MEMBER: ABAA ILAB

Abraham Pais

ABRAHAM PAIS offprint collection
Physics & Physicists

CATALOGUE 194:

JEFF WEBER RARE BOOKS

1815 Oak Ave
Carlsbad CALIFORNIA 92008

Phone: 323 333 4140 ; e-mail: weberbks@pacbell.net
www.WeberRareBooks.com

ᔗ ABRAHAM PAIS (1918-2000) "was a brilliant physics student at the University of Utrecht when the Nazi's came to power. Managing to finish his Ph.D. just days before Jews were barred altogether from the universities brought him the distinction of being the last Jew to receive a doctorate degree in wartime Holland. His dissertation attracted the attention of Nils Bohr, who sent a message inviting him to work with him in Denmark. With Tina's help he went underground for the duration of the war, unable to leave Holland to accept Nils Bohr's invitation until 1946. The following year he was a colleague of Einstein at the Princeton Institute for Advanced Study. In 1982 he published a critically acclaimed biography of Einstein, in 1986, a definitive history of the study of modern physics, and more recently a biography of Nils Bohr. He is presently a physics professor at Rockefeller University." – Humboldt.edu [web-source]

ALL THE ENTRIES IN THIS LIST ARE FROM THE PERSONAL COLLECTION OF BRAM PAIS; each section, grouped by author, is for sale "BY AUTHOR".


Christian Fronsdal

FRONSDAL, Christian (b1931-), Norwegian-American theoretical physicist, particularly in thermodynamics. "He is concerned with elementary particle physics (eg, Regge pole theory in the 1960s), gravitation, quantum field theory (for example of massless particles, in curved space times), mathematical physics. With Moshé Flato, Daniel Sternheimer, Francois Bayen and André Lichnerowicz, he introduced quantification quantification in 1978." – Wikip. From his own web-page: "[I am working on a book about thermodynamics.] This work has some controversial elements and departs from traditional views and methods in many ways. For example, I emphasize the lagrangian approach…" [S13248]

[2 offprints] $ 25

FRONSDAL, C. *On non-compact groups. IV. Some representations of SU$_4$ (NU$_{2/4}$).* Offprint from: Proceedings of the Royal Society, A, volume 288, pp. 113-122, 1965.

FRONSDAL, C. *On non-compact groups. III. The linear representations of SU$_3$.* Offprint from: *Proceedings pf the Royal Society, A, Volume 288, pp. 98- 112, 1965.*
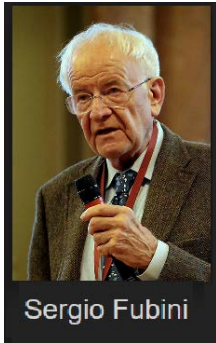
Sergio Fubini

FUBINI, Sergio (1928-2005), Italian theoretical physicist, one of the pioneers of the string theory. "1945, he attended the Lycée in Turin, where he studied physics and in 1950 graduated "cum laude." From 1958 to 1967, he was at CERN in Geneva. In 1959, he became a professor for nuclear physics at University of Padua. In 1961, he became a professor for theoretical physics at University of Turin. From 1968 to 1973, he was at MIT, but taught summer courses in Turin. He went back to CERN in 1973 and from 1971 to 1980 was a member of the advisory board and had an important role in planning the Large Electron Positron Collider (LEP) as well as in discussions for the construction of the Middle East's Synchrotron, SESAME. At MIT, he was with Gabriele Veneziano, Emilio Del Giudice and Paolo Di Vecchia at the center of an active school of theoretical physicist with close connections to Italy (with one of the Italian INFN and MIT financed "Bruno Rossi" exchange programs). He and his co-workers did fundamental work in string theory. Other well-known MIT colleagues at that time were Victor Weisskopf (who was recruited by Fubini to MIT), Steven Weinberg and Roman Jackiw. From 1994 to 2001, he was a professor in Turin. Fubini worked in the 1960s on current algebras and S-matrix theory (Regge trajectories among other things), in particular on their field-theoretical foundations. In the 1970s, he was with his MIT colleagues and pupils Gabriele Veneziano, Emilio Del Giudice and Paolo Di Vecchia one of the pioneers of string theory (the team introduced the so-called DDF states). He worked in the 1970s on other classical solutions of Yang–Mills equations and conformally invariant quantum field theory. Fubini received the Dannie Heineman Prize for Mathematical Physics in 1968." – Wikip. [S13249]

[2 offprints] $ 45

1.   **FUBINI, S.; BERTOCCHI, L.; FURLAN, G.** *The Short-Wavelength Approximation to the Schrödinger Equation.* From: CERN. 16 Gennaio 1965, Il Nuovo Cimento, Serie X, Vol. 35, pp. 599-634. "We study the short-wavelength approximation to the Schrödinger equation in the presence of one and two turning points. Two methods are presented which allow the evaluation of the higher corrections to the elementary W.K.B. approximation. The first method, the 'real method', employs higher

transcendental functions, the second one uses complex integration techniques." – abstract.

2. **FUBINI, S.; BERTOCCHI, L.; FURLAN, G.** *On the Theory of Scattering by Singular Potentials.* From: CERN. 16 Gennaio 1965, Il Nuovo Cimento, Serie X, Vol. 35, pp.633-643. "Some characteristic features of the scattering by singular potentials are investigated both in the low- and the high-energy limit." – summary.

FUJII, Akihiko, Fujii was at the Laboratori Nazionali di Frascati, Rome. [S13250]

[2 offprints] $ 45

FUJII, A.; CELEGHINI, Enrico. *Form Factors of K_{13} Decay and Kaon Production by High-Energy Neutrinos.* From: CERN. 10 Aprile 1963, Il Nuovo Cimento, Serie X, Vol. 28, pp.90-98. Summary: "The cross-section of the kaon-production reaction by high energy neutrinos, $v+p \rightarrow p+l-+K+$, is computed in the peripheral approximation. Numerical estimates are made with specific form factors derived from the dispersion theory. The cross-section depends on such a dynamical model, hence it can serve as a criterion of the model."

FUJII, A. *Muon Capture in Hydrogen.* 16 Febbraio 1963, *Il Nuovo Cimento*, Serie X, Vol. 27, pp. 1025-1031.

FUJITA, Jun-Ichi, Fujita was associated with the Department of Physics, College of Science and Engineering, Nihon University, Tokyo. [S13251]

[1 offprint] $ 25

FUJITA, Jun-Ichi. *Theory on Vector Interactions in Nuclear Beta Decay.* Offprint from: Progress of Theoretical Physics, volume 28, number 2, pp. 338-346. August 1962. "In a previous work the Siegert theorem was extended to vector interactions in nuclear beta decays on the basis of the conserved vector current hypothesis. It was already shown that the experimental data of RaE are consistent with the conserved vector current hypothesis. The purpose of this note is to give the general formulae for arbitrary order of forbidden transitions, since it is highly desirable to investigate as many other non-unique forbidden beta decays as possible. Through this note the validity of non-relativistic

approximation is assumed for the motion of nucleons in nuclei, so that our formalism is completely analogous to the conventional theory of nuclear radiative transitions." – Abstract. Fujita was associated with the Department of Physics, College of Science and Engineering, Nihon University, Tokyo.

**FUKUDA, Hiroshi,** Tokyo University, Dept. of Physics. [S13252]

[7 offprints] $ 1,000

1. **FUKUDA, Hiroshi; MIYAMOTO, Y.; MIYAZIMA, T.; TOMONAGA, S.** *Applicability of Pauli's Regulator to the Γ [gamma] —Decay of Neutrettos.* Offprint from: *Progress of Theoretical Physics,* vol. IV, no. 4, October-December, 1949. pp. 477-484. Signed by Abraham Pais.

2. **FUKUDA, Hiroshi; HAYAKAWA, Satio; MIYAMOTO, Yoneji.** *On the Nature of τ-Mesons. I.* Offprint from: *Progress of Theoretical Physics,* Vol. V, No. 2, March-April, 1950. pp. 283-304. Signed by Abraham Pais. SIGNED IN JAPANESE BY ALL THREE AUTHORS. Abstract: "The mass, the life and the interaction with nucleons of 'I'-mesons discovered in photographic plates are qualitatively discussed. The probabilities of 'I'_x+lI'0 and 'I'-II'+r for various combinations of their couplings are calculated by Tomonaga-Schwinger formalism. The generalized selection tule lor the system composed of many mesons is pres~nted, from which some patticular sets of the types 0. these mesons, fot example scalar and pseudoscalar, are admitted to explain the rather long life time of 'I'-meson, _10-11 sec. The life time for 'I'-.3x decay calculated by our method is obtained as long as 10-Il sec. consistent with experiments. This result suggests that the interaction of x-meson with nucleon is considerably weak. Some arguments for and against such presumption are discussed. The varieties of mesons, called varitrons, are classified as x- and p-types." **Hayakawa**: Hayakawa was a "well-known pioneer of astrophysics, having completed … a theory on the origin of cosmic rays and propsed … gamma ray astronomy. Later he was a leading proponent of X-ray astronomy and IR astronomy in Japan." – Memoriam. See: Jun Nishimura, "Satio Hayakawa and dawn of high-energy astrophysics in Japan," 2015; "In Memoriam, Satio Hayakawa (1923-1992), SAO/NASA Astrophysics Data System (ADS), Space Science Reviews, 62: 1-2, 1993.

3. **FUKUDA, Hiroshi; HAYAKAWA, Satio** (1923-1992)**; MIYAMOTO, Yoneji.** *On the Nature of τ-Mesons. II.* Offprint from: *Progress of Theoretical Physics,* Vol. V, No. 3, May-June, 1950. pp. 352-372 Signed by Abraham Pais. SIGNED IN JAPANESE BY ALL THREE AUTHORS.

4. **FUKUDA, Hiroshi; NAKAMURA, S.; Ono, K.; SASAKI, M.; TAKETANI, M.** *Analysis on the Two Meson Theory.* Offprint from: *Progress of Theoretical Physics,* Vol. 5, No. 4, pp. 740-747, July-August, 1950. Department of Physics, University of Tokyo. Signed by Abraham Pais. Abstract: "Possible models for the two mesons, π and μ are selected by testing them with the present experimental knowledges, concerning the β-decay, the μ-meson capture, and the π-μ decay."

5. **FUKUDA, Hiroshi; AIDZU, K.; FUJIMOTO, Y.; HAYAKAWA, S.; TAKAYANAGI, K.; TAKEDA, G.; YAMAGUCHI, Y.** *On the Negative π-Meson Capture.* Offprint from: *Progress of Theoretical Physics,* Vol. 5, No. 6, November-December, 1950. pp. 931-947. Signed by Abraham Pais.

6. **FUKUDA, Hiroshi; HAYAKAWA, Satio.** *On the Decay of a Heavy Dirac Meson.* Offprint from: *Progress of Theoretical Physics,* vol. V, no. 6, November-December, 1950. pp. 993-996.

Authored with a Future Nobel Prize Winner

7. **FUKUDA, Hiroshi; FUJIMOTO, Yoichi; KOSHIBA, Masatoshi** (1926-)**.** *Nuclear Interaction of μ-Meson.* Offprint from: *Progress of Theoretical Physics,* vol. VI, no. 5, September –October, 1951. pp. 788-800. The Department of Physics, University of Tokyo. Signed by Abraham Pais. Abstract: "The experimental results concerning nuclear events in cosmic-ray underground, obtained by E. P. George and J. Evans by means of nuclear emulsions, were found to be in rather good agreement with the theoretical calculation, where the electromagnetic interaction of μ-meson with nucleon were treated in detail by Feynman-Dyson's procedure." **KOSHIBA**: (1926-) is a Japanese physicist. He jointly won the Nobel Prize in Physics in 2002 "for pioneering contributions to astrophysics, in particular for the detection of cosmic neutrinos". **FUJIMOTO**: physicist (born 1925-), studied at Tokyo University, taking his degree in 1947. He became a nuclear physicist, professor at Waseda University. Studied at Bristol University (1953-54), Assistant Professor at Kyoto University, facult of science, Professor at Tokyo University, Research Institute of Nuclear Physics. Member, Japan Society of Physics.
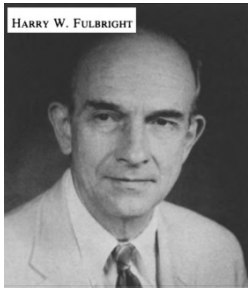
FULBRIGHT, Harry W. (1918-2009), University of Rochester, Rochester, N.Y., Professor of Physics, educated at Washington University in St. Louis, taking his A.B. in 1940, he continued with his M.S. and Ph.D. received in 1944. He was in charge of the Washington University cyclotron [later shipped to India where Fulbright helped install it for its second career] and from 1942-44 was under contract to the Manhattan District Project, transferring to the Los Alamos Scientific Laboratory through 1946. At this point he taught four years at Princeton University as Assistant Professor, and then left for Rochester in 1950. He earned a Fulbright and Guggenheim Fellowship, a Fellow at Copenhagen, lecturing widely in Strasbourg, Chandigarh, and Leningrad. "Although Fulbright concentrated on nuclear physics for most of his career, his interests turned to Astronomy in his later years... Harry Fulbright was a brilliant and versatile experimentalist..." Fullbright wrote many papers and also contributed: [1] "Particular detection methods," written jointly by S.C. Curran, Fulbright, G. Bishop and R. Wilson. [2] CHAPTER XXI, "Particular Problems Studied with Scintillation Techniques," by P. E. Cavanagh, H. Fulbright, S. De Benedetti, R. E. Bell and M. Deutsch. Fulbright retired July 1, 1989. – Obituary, Judy Pipher (University of Rochester), Bill Forrest (University of Rochester).

FULBRIGHT, H. W. *Beta Spectroscopy by Use of a High Pressure Proportional Counter.* Offprint from*: Beta- And Gamma-Ray Spectroscopy,* pp. 184-191. Amsterdam: North-Holland, 1955. Blue printed wrappers. Fine. [S13253] $ 20

FULTON, Thomas (1937-2011), born in Budapest, Hungary, his given name was Tomas Feuerzeug. His parents escaped the Nazi regime and headed first for Spain and then Cuba, finally arriving in New York City. He studied under Julian Schwinger at Harvard University. Continuing his education Fulton did two years of postdoctoral work at the Institute for Advanced Study in Princeton, N.J., working under J. Robert Oppenheimer, scientific director of the Manhattan Project. In 1956 he joined the faculty at Johns Hopkins University, staying there until his retirement in 2000. He is recognized for his work in

high-energy physics, quantum electrodynamics and atomic theory. Institute for Theoretical Physics, University of Vienna, Vienna, Austria. He was both a Fulbright Research Scholar and Guggenheim Fellow [1964], a fellow of the American Physical Society. He is considered the father of high-energy physics at JHU. See: *"Thomas Fulton, 83, father of high-energy physics at JHU."* – The JHU Gazette. April 25, 2011. [S13254]

[4 offprints] $ 160

FULTON, T.; Newton, R. G. *Explicit Non-Central Potentials and Wave Functions for Given S-Matrices.* Il, Nuovo Cimento, Serie X, Vol. 3, pp. 677-717, Aprile 1956. Signed by Abraham Pais.

FULTON, T.; Wess, J. *Symmetry Group Containing Lorentz Invariance and Unitary Spin.* Offprint from: *Physics Letters,* Volume 14, Number 1, pp. 57-60, January 1, 1965.

FULTON, T.; Wess, J. *Mass Relations and the "Super-Lorentz Group" L.* Offprint from: *Physics Letters,* Volume 14, Number 4, pp. 334-336, February 15, 1965.

FULTON, T.; Wess, J. *Electromagnetic Form Factors and the Generalized Poincaré Group.* Offprint from: *Physics Letters,* Volume 15, Number 2, pp. 177-179, March 15, 1965.

Susumu Furuichi

FURUICHI, Susumu: (b1931-), Japanese physicist, received his Bachelor of Science 1953, Master of Science 1955, Doctor of Philosophy in Science 1959, University Hiroshima, Furuichi's career path starts with. Lecturer Department Physics, Rikkyo University, Tokyo, 1958-1963, assistant professor, 1963-1968, professor, 1968-1997. Dean of the faculty of science Rikkyo University, 1975-1979, registrar, 1983-1986, managing director, since 1995, professor emeritus, since 1997. – Prabook 2017. [S13256]

[2 offprints] $ 85

o   **FURUICHI, Susumu; KODAMA, Tatsuro; OGAWA, Shuzo; SUGAHARA, Yoshiko; WAKASA, Akira; YONEZAWA, Minoru.** *On the Spins and Decay Interactions of $K_{\mu 3}$ and K_{e3}.* Offprint from: *Progress of Theoretical Physics,* Vol. 17, No. 1, pp. 89-106, January 1957.

- **FURUICHI, Susumu; KANADA, Hiroyuki; WATANABE, Keiji.** *Two-Pion-Exchange Contribution to Nucleon-Nucleon Scattering on the Basis of Pion-Pion Dynamics.* Offprint from: *Progress of Theoretical Physics,* Volume 44, Number 3, pp. 711-728, September 1970.

Galindo Tixaire Alberto

GALINDO, Alberto Tixaire (1934-), Spanish theoretical physicist pioneer and emeritus professor at the Universidad Complutense, Madrid, Spain. He graduated from the Ramón y Cajal Institute, Huesca, in 1952, studied exact sciences at the University of Zaragoza, earning the Casañal Prize in 1955 and 1956. He earned his PhD in the physical sciences in 1960 from the Universidad Complutense de Madrid. From 1961-2 he was a temporary member of the Courant Institute of Mathematical Sciences of New York University. He was Researcher in the Théorique Division of the European Organization for Nuclear Research (CERN) in Geneva from 1962 to 1964 (during the time of this paper). He was co-founder of Grupo Interuniversitario de Física Teórica (GIFT). Galindo is a member of the Royal Academy of Exact, Physical and Natural Sciences, Royal Academy of Medicine, and the European Academy of Sciences & Arts. Among the prestigious awards he has earned are the 1970 medal of physics, Real Sociedad Española de Física y Química, National Prize of Research Santiago Ramón y Cajal, and others. [S13257]

GALINDO, Alberto; MORALES, A; NUÑEZ-LAGOS, R. *Superselection Principle and Pure States of n-Identical Particles.* Offprint from: *Journal of Mathematical Physics,* vol. 3, no. 2, pp. 324-328, March-April, 1962. Abstract: Wightman's assumption of commutative superselection rules is proved to be equivalent to Jauch's assumption of existence of a complete set of commuting observables. The analysis of coherence is carried out by using the Gel'fand representation theory and the general structure of the complete sets of compatible observables is given when the Hilbert space is separable. The above equivalence provides the physical grounds to incorporate both assumptions into the axiomatic foundations of quantum theory as a single "superselection principle." To illustrate how this principle works, the problem of determining the physically realizable states of an assembly of n- identical particles is analyzed and solved. See also: Maximilian A. Schlosshauer, *Decoherence: and the Quantum-to-Classical Transition.* $ 50

Won the Enrico Fermi Prize in 2003

GATTO, Raffaele Raoul (1930-): Italian physicist, born in Catania, Italy. His major achievement is in the field of particle physics. He has taught widely, and stationed presently at the University Geneva (since 1976); he is also an Associate physicist CERN (also since 1976). Gatto jointly received, with Nicola Cabibbo, the Enrico Fermi Prize in 2003 from the Italian Physics Society with the following motivation: "For their fundamental contributions to the theory of weak interactions. Raffaele Raoul Cat for his pioneering work in the field of weaker decay of strange particles and for his role as chief in a fundamental sector of subnuclear physics. Nicola Cabibbo for his theory of mixing quarks down and strange in weak decades, where the known parameter called "corner of Cabibbo" plays a fundamental role. To Luciano Maiani for introducing together with S. Glashow and J. Iliopoulos, the so-called GIM mechanism, which, with the existence of the fourth quark, allowed to overcome the problem of neutral currents with a change of flavor." [S13259]
[23 offprints] $ 475

   1 **GATTO, R.** *Angular Correlation in Cascade Decay.* Il Nuovo Cimento, Serie X, vol. 2, pp. 841-844, Ottobre 1955.

   2 **GATTO, R.** *A Possible Method for Determining the Spin of the Σ and of the Λ.* Il Nuovo Cimento, Serie X, vol. 3, pp. 665-668, Marzo 1956. Signed by Abraham Pais.

3   **GATTO, R.** *Charge Properties of the Weak Decay Interactions of the New Particles.* Il Nuovo Cimento, Serie X, vol. 3, pp. 318-335, Febbraio 1956. Signed by Abraham Pais.

4   **GATTO, R.; CABIBBO, N.** *Electron-Positron Colliding Beam Experiments.* Offprint from: *The Physical Review,* vol. 124, no. 5, pp. 1577-1595, December 1, 1961.

5   **GATTO, R.** *Spin-Statistics Connection for Strange Particles.* Offprint from: *Physics Letters,* vol. 5, no. 1, pp. 56-57, June 1, 1963.

6   **GATTO, R.** *Classification of Lepton Currents.* Il Nuovo Cimento, Serie X, vol. 28, pp. 567-589, Maggio 10, 1963.

7   **GATTO, R.; ADEMOLLO, M.** *Complete Spin Tests for Fermions.* Offprint from: *The Physical Review,* vol. 133, no. 2B, B531-B541, January 27, 1964.

8   **GATTO, R.; MAIANI, L.; PREPARATA, G.** *Properties of Weak Amplitudes in Broken U(12).* Offprint from: *The Physical Review,* vol. 139, no. 5B, B1294-B1296, September 6, 1965.

9   **GATTO, R.; MAIANI, L.; PREPARATA, G.** *Classification of Higher Boson Resonances.* Il Nuovo Cimento, Serie X, vol. 39, pp. 1192-1196, Ottobre 16, 1965.

10   **GATTO, R.; MAIANI, L.; PREPARATA, G.** *Kinetic Supermultiplets of U(12).* Offprint from: *The Physical Review,* vol. 140, no. 6B, B1579-B1583, December 20, 1965.

11   **GATTO, R.; ADEMOLLO, M.; PREPARATA, G.** *Density-Matrix Analysis for Spin Determination.* Offprint from: *The Physical Review,* vol. 140, no. 1B, B192-B198, October 11, 1965.

12   **GATTO, R.; BUCCELLA, F.** *The Collinear Groups $(SU_3 \times SU_3)_{coll}$ and $(SU_2 \times SU_2 \times W(\sigma_z Y))_{coll}$.* Il Nuovo Cimento, Serie X, vol. 40, pp. 684-689, Novembre 21, 1965.

13   **GATTO, R.; ADEMOLLO, M.; PREPARATA, G.** *Spin Tests for Bosons.* Offprint from: *The Physical Review,* vol. 139, no. 6B, B1608-B1618, September 1965.

14 **GATTO, R.; BORCHI, E.** *Assignment of Higher Boson Resonances to A p-Wave Multiplet of SU_6.* Offprint from: *Physics letters,* vol. 14, no. 4, February 15, 1965.

15 **GATTO, R.; BUCCELLA, F.; ALTARELLI, G.** *SU_6 and Non Leptonic Hyperon Decays.* Offprint from: *Physics Letters*, vol. 14, no. 1, January 1, 1965. Original Salmon printed wrappers.

16 **GATTO, R; MAIANI, L.; PREPARATA, G.** *Relation between D/F and G_A/G_V from Current Algebra.* From: *Physical Review Letters,* vol. 16, no. 9, pp. 377-379, February 28, 1966.

17 **GATTO, R; ADMOLLO, M.; LONGHI, G.; VENEZIANO, G.** *The $SU(6)_w$ Algebra at Infinite Momentum, It's Tensor Charges, and Electric Dipoles.* Offprint from: *Physics Letters,* vol. 22, no. 4, pp. 521-524, September 1, 1966.

18 **GATTO, R; MAIANI, L.; PREPARATA, G.** *Saturation of the SU_6 Algebra and a Possible Classification Group for Hadrons.* Il Nuovo Cimento, Serie X, vol. 44, pp. 1279-1283, Agosto 21, 1966.

19 **GATTO, R; BUCCELLA, F.; VENEZIANO, G.** *Analysis of Sum Rules Following from Local Commutation Relations of Currents.* Il Nuovo Cimento, Serie X, vol. 42, pp. 1019-1028, Aprile 21, 1966.

20 **GATTO, R.; MAIANI, L.; PREPARATA, G.** *Models for Nonleptonic Decays based on the Chiral U_3 x U_3 Algebra.* Il Nuovo Cimento, Serie X, vol. 41, pp. 622-624, Febbraio 21, 1966.

21 **GATTO, R.** *Weak Self-Masses, Cabibbo Angle, and Broken SU_2 x SU_2.* Offprint from: *Physics Letters, vol. 28B, no. 2, pp. 128-130, 1968.*

22 [Attached to:] **Gatto, R.** *Weak Self-Masses and Cabibbo Angle. Discussion of Higher Orders.* Lettere al Nuovo Cimento, Serie X, vol. 1, pp. 1-14, Gennaio 10, 1969.

23 **GATTO, R.** *Cabibbo Angle and SU_2 x SU_2 Breaking.* Springer Tracts in Modern Physics, vol. 53*, Berlin 1970, pp. 45-106. Rubber-stamped A. Pais.

Roy J. Glauber

GLAUBER, Roy J: (b.1925). Roy Jay Glauber is an American theoretical physicist, born in 1925 in New York City. He was a member of the 1941 graduating class of the Bronx High School of Science, and matriculated at Harvard University. After his sophomore year he was recruited to work on the Manhattan Project, where (at the age of 18) he was one of the youngest scientists at Los Alamos National Laboratory. After two years involved in calculating critical mass for the atom bomb, he returned to Harvard completing his bachelor's in 1946 and PhD in 1949. Currently, he is the Mallinckrodt Professor of Physics at Harvard University and Adjunct Professor of Optical Sciences at the University of Arizona. Glauber was jointly awarded the 2005 Nobel Prize in Physics "for his contribution to the quantum theory of optical coherence". In this work, published in 1963, he created a model for photodetection and explained the fundamental characteristics of different types of light, such as laser light and light from light bulbs. His theories are widely used in the field of quantum optics. He currently serves on the National Advisory Board of the Center for Arms Control and Non-Proliferation, the research arms of Council for a Livable World. Glauber has also received many honors for his research, including the Albert A. Michelson Medal from the Franklin Institute in Philadelphia (1985), the Max Born Award from the Optical Society of America (1985), the Dannie Heineman Prize for Mathematical Physics from the American Physical Society (1996), and the 2005 Nobel Prize in Physics. Professor Glauber was awarded the 'Medalla de Oro del CSIC' ('CSIC's Gold Medal') in a ceremony held in Madrid, Spain. He was elected a Foreign Member of the Royal Society as well (ForMemRS) in 1997. [S13260]

GLAUBER, R. J. *High Energy Collision Theory.* Offprint from: *Lectures in Theoretical Physics,* Volume 1, pp. 315-414, 1959. WITH 3 sheets of yellow-lined paper, containing notes in manuscript by Abraham Pais. Abstract: After a general discussion of the simple problem of elastic scattering by a static potential where some of the familiar methods of treating the problem and certain very useful theorems regarding the scattering amplitudes are reviewed, the high-energy approximation is developed and applied to problems of gradually increasing complexity. Finally, the collisions involving many-body systems are discussed. See also: Vincenzo Barone, Enrico Predazzi, *High-Energy Particle Diffraction.* $ 225

GOLDBERG, Irwin. Goldberg was in 1961 the Dept. of Physics, University of Michigan. He was UM Assistant Professor of Physics in 1959. He is also associated with the Department of Physics, Clarkson College of Technology, Potsdam, New York. Leon F. Landovitz was with Brookhaven National Laboratory, Upton, New York. At the time of this paper Landovitz was a graduate student of science, Yechiva University, New York. [S13261]

GOLDBERG, Irwin; LANDOVITZ, Leon F. *Existence of a Stable Neutral Meson.* Il Nuovo Cimento, Serie X, Vol. 21, pp. 869-871, 1 Settembre 1961. $ 25

Co-Author of the Doomsday Clock

GOLDSMITH, Hyman H. (1907-1949), American physicist in 1943, Goldsmith became coordinator of information for the Metallurgical Lab in Chicago. After Hiroshima, when the existence of the atomic bomb became public knowledge, Goldsmith was one of many atomic scientists that wanted there to be control on nuclear weapons. Once the war had come to an end, Hyman helped

establish the *Bulletin of the Atomic Scientists* with John Simpson and Eugene Rabinowitch. He served as a co-editor with Rabinowitch until his passing. While he never wrote articles for the Bulletin, he was an outstanding editor and worked long-hours to perfect others' works. He worked as chief of the information and publications division at the Brookhaven National Laboratory in New York after the war as well. "Goldsmith and botanist and biophysicist Eugene Rabinowitch in 1945, published its Doomsday Clock, with its hands set to seven minutes to midnight, for the first time on this date in 1947. The clock was meant to warn of the dangers of nuclear annihilation; it was moved one minute closer to midnight the following year after the first Soviet nuclear test."

On August 7, 1949, Hyman died tragically at the age of 42 after being swept over a waterfall while swimming in the West River in Vermont. [S13263]

$ 650

GOLDSMITH, H. H.; INGLIS, D. R. *The Properties of Atomic Nuclei. I. Spins, Magnetic Moments, and Electrical Quadrupole Moments.* Upton, NY, 1948. 4 pp. BNL-I-5. Brookhaven National laboratory, Information and Publications Division, Upton, N.Y. Original printed cover. Signed by Abraham Pais. Publications by Goldsmith are rarely seen on the market.

GOOD, R. H., Jr. BIOGRAPHY: R.H. Good Jr. worked at the Institute for Atomic Research and Department of Physics, Iowa State University, Ames, Iowa. Good was also with the Department of Physics, Pennsylvania State University, University Park, Pennsylvania. At the time Frank H. Spedding (1902-1984) was director of the Ames Laboratory. -- [2 offprints]. From the collection of Abraham Pais. Very good. [S13262]

$ 22

o **GOOD, R. H.; HAMMER, C. L**. Electrodynamic Quantization Process. Offprint from: Annals of Physics, Volume 12, No. 13, pp. 463-475, March 1961. Abstract: Recently a quantum theory of the free Maxwell field was given that avoided discussion of nonphysical photons. The extension to include the interaction with electrons is given in this paper. This approach leads to a formulation equivalent to the gauge-independent theory of Belinfante and Lomont. A complete discussion of the integrals of motion is given, including their connections with displacement operators.

GOOD, R. H.; MEHLHOP, W. A. W.; MURTY, S. S.; BOWLES, P.; BURNETT, T. H.; HOLLAND, C. H.; PICCIONI, O.; SWANSON, R. A. Interference between Neutral Kaons and Their Mass Difference. Offprint from; *Physical Review,* Vol.

172, No. 5, pp. 1613-1625, 25 August 1968. Abstract: A K+ beam of 990-MeVc momentum was used to produce a K0 beam in charge-exchange collision with a copper target. By interposing an iron regenerator at a certain distance from the target and taking spark-chamber pictures of 2π decays behind the regenerator, we have observed the interference in the 2π decay mode between the KS state produced in the original charge exchange and the K_S state (K_{LS}) produced via regeneration. The difference in phase between these KS and KLS states depends upon the proper time elapsed between production and regeneration (because of the mass difference between K_S and K_L) and can therefore be changed at will by changing the corresponding distance. The shape of the curve with the observed minimum gives us the magnitude of the mass difference, and its sign as well if the phase of the regeneration amplitude is given. In a separate work we have determined that phase from scattering experiments with charged kaons on iron nuclei. Comparing that information with the present experiment, we obtain the following results: (1) The two-pion states into which KS and KLS decay are quantum-mechanically identical. Since |KL> and |KLS> interference has already been observed, we must then expect that the time dependence of the 2π decay of K0 will differ from that of $\overline{K}^0$ because of the $|K_S\rangle \rightarrow |2\pi\rangle$, $|K_L\rangle \rightarrow |2\pi\rangle$ interference. (2) The sign of the mass difference is such that KL is heavier than KS with a level of confidence that, barring unknown systematic errors, appears to be beyond question. (3) The value of the mass difference obtained by us is 0.42+/-0.04 in units of $\hbar\tau S$, where τ_S is the K_S mean life. (4) We have also observed the effect of the constructive interference between the scattered amplitude f11|KS> and the diffraction-regenerated amplitude $f_{21}|K_S\rangle$. This effect confirms that K_L is heavier than K_S." from; Physical Review, Vol. 172, No. 5, pp. 1613-1625, 25 August 1968.

GOODALL, Marcus Campbell (1914-1988). BIOGRAPHY: Education: Uppingham School 1927-32; Balliol College, Oxford, 1932-35. Goodall was, at the time of this publication, with the Massachusetts Institute of Technology. His career experience: Marconi Ltd., Research Dept., Essex, 1945-49; FRGS, 1948; Leverhukne Research Fellow, 1949-50; Institute for Advanced Studies (Mathematics), Princeton; Research Fellow, Marine Biological Laboratory, Massachusetts, 1951; Lecturer in Zoology (Biophysics), University of Michigan, 1953; Research Associate, 1956, staff member, Research Laboratory of Electronics, 1961, MIT; Associate Member, Institute for Biomedical Research, Chicago, 1966; Associate Professor of Biophysics, University of Alabama, 1970 (Emeritus Professor, 1984).

2 offprints. Original wrappers. From the collection of Abraham Pais. Very good. [S13255]

<div align="right">$ 95</div>

- **GOODALL, M. C**. Foundations of Relativistic Quantum Mechanics. Offprint from: Nature, Vol. 195, No. 4837, pp. 167-168, July 14, 1962.

- **GOODALL, M. C**. Path Integral Formulation of Relativistic Quantum Mechanics, Offprint from: Nature, Vol. 196, No. 4852, p. 370, October 27, 1962. Both paper stapled together and each has ink annotation marginalia [Abraham Pais (his copy) or the author?]. The second paper cites (among others) Richard Feynman's "Space-Time Approach to Non-Relativistic Quantum Mechanics," [see: Reviews of Modern Physics, 20, p. 367, 1948; and his Theory of Fundamental Processes, NY, 1961].).

 GORTER, Cornelis Jacobus (1907-1980), Dutch experimental and theoretical physicist. He spent most of his career at the University of Amsterdam, where he succeeded Nobel Prize winner Pieter Zeeman. Some of his more notable discoveries include paramagnetic relaxation, a two-fluid model of superconductivity, and the 'Gorter model' of a second-order phase transition. Gorter also conducted significant research on antiferromagnetism with Johannes Haantjes. He edited six volumes of the series "Progress in Low Temperature Physics," and received the Fritz London Award for his contributions to low-temperature physics. His acceptance speech, title "Bad Luck in Attempts to Make Scientific Discoveries," detailed numerous important discoveries that he had almost made. [S13264] [7 offprints]

<div align="right">$ 300</div>

1. **GORTER, C. J.; TEUNISSEN, P.** *Further Measurements on Paramagnetic Dispersion.* Offprint from: *Physica VI*, 2, pp. 145-155, The Hague: Martinus Nijhoff, February 1939. Original light green printed wrappers. Signed by Pais.

2. **GORTER, C. J.** *Probleme des dia- und Paramagnetismus.* Offprint*: Zeitschrift für Elektrochemie,* vol. 45, 615-621, 1939. Pages wrinkled but not ripped.

3. **GORTER, C. J.; DIJKSTRA, L. J.; GROENDIJK, H.** *Paramagnetic Absorption and Dispersion in Chromium Potassium Alum.* Offprint from: *Physica VII,* 7, pp. 625-634, The Hague: Martinus Nijhoff, July 1940. Original light brown printed wrappers. Signed by Pais.

4. **GORTER, C. J.; EISSES, J.; GROENDIJK, H.** *Paramagnetic Dispersion in Vanadous Ammonium Sulphate.* Offprint from: *Physica VII,* 9, pp. 865-868, The Hague: Martinus Nijhoff, November 1940. Original light brown printed wrappers. Signed by Pais.

5. **GORTER, C. J.; KAHN, B.** *On the Theory of the Gyromagnetic Effects.* Offprint from: *Physica VII,* 8, pp. 753-764, The Hague: Martinus Nijhoff, October 1940.

6. **GORTER, C. J.** *De Vooruitgang Der Natuurkunde.* Groningen, Batavia: J.B. Wolters, 1946. Or. omslag. 22 pp. Rede uitgesproken op 27 september 1946. Original olive-green printed wrappers, "Van den Schrijver" - "From the writer".

7. **GORTER, C. J.** *Some facts about Superconductivity.* Offprint from: *Physica XIX,* pp. 1-8, 1953. Signed by Pais.

Harold Grad

GRAD, Harold: (1923-1986), American applied mathematician, specializing in the work of statistical mechanics to plasma physics and magnetohydrodynamics. He received his bachelors in electrical engineering from Cooper Union in 1943 and his masters at NYU in 1945. Grad did his doctoral work under Richard Courant and graduated in 1948. His thesis was on the approximation of the Boltzmann Equation by torque. His honors/awards consist of the Eringen Medal in 1982. In 1986 the James Clerk Maxwell Prize in Plasma Physics from the American Physical Society, and in 1970 he became a member of the National Academy of Sciences. He was an invited speaker at the International Congress of Mathematicians in Nice in 1970 and in Stockholm in 1962. Today the Courant Institute offers the Harold Grad Memorial Prize to outstanding performance and promise as a graduate student. [S13265]

[1 offprint] $ 25

GRAD, Harold. *Note on N-Dimensional Hermite Polynomials.* Offprint from: *Communications on Pure and Applied Mathematics,* Volume II, 1949. 325-330.

GREEN, Herbert Sydney (1920-1999), British-Australian physicist and student of Nobel Laureate Max Born. After doing post-doc work at Princeton and the Institute of advanced study in Dublin, before taking a position at the University of Adelaide in 1951, where he stayed for the rest of his life. Green's research extended into a number of different areas, including kinetic theory and plasma physics, quantum mechanics, statistical mechanics, and Environmental physics. [S13266]

[3 offprints] $ 100

- o **GREEN, Herbert Sydney**. *The Second Virial Coefficient near Absolute Zero.* Offprint from: *The Proceedings of the Physical Society*, A, Vol. LXV, pp. 1022-1029. 1952.

- o **GREEN, Herbert Sydney**. *Spinor fields in general relativity.* Offprint from: *Proceedings of the Royal Society,* A, volume 245, pp. 521-535, 1958.

- o **GREEN, Herbert Sydney**. *Exact Solution of the Association Problem by a Matrix-Spinor Method with Applications to Statistical Mechanics.* Offprint from: *Reviews of Modern Physics,* Vol. 32, No. 1, pp. 129-141, January, 1960. Orange printed wrappers.

GREENBERG, Oscar Wallace: (1932-?), American physicist, professor at University of Maryland, Dept. of Physics & Astronomy, and Rockefeller University. Greenberg posited the existence of a hidden, 3-valued charge, called color charge, of subatomic particles, "quarks,"' in 1964, the same year that quarks were posited as constituents of hadrons by Murray Gell-Mann and, independently, by George Zweig.

[4 offprints] [S13267] $ 250

o **GREENBERG, O. [Oscar] W.** *Spin and Unitary-Spin Independence in a Paraquark Model of Baryons and Mesons.* Offprint from: *Physical Review Letters,* Volume 13, number 20, pp. 598-602, 16 November 1964. V540 1-5.

o **GREENBERG, O. W.; Messiah, A. M. L.** *Symmetrization Postulate and Its Experimental Foundation.* Offprint from: *The Physical Review,* Vol. 136, No. 1B, B 248-B267, 12 October 1964.

o **GREENBERG, O. W.** *Coupling of Internal and Space-Time Symmetries.* Offprint from: *The Physical Review,* Vol. 135, No. 6B, B1447-B1450, 21 September 1964.

o **GREENBERG, O. W.** *Magnetic Moments of Spin ½ Particles in External Fields.* Offprint from: *Physics Letters,* Volume 19, number 5, 2 pp., 15 November 1965.

GROSJEAN, P. V. *Static Meson Potentials and the Deuteron Problem.* Offprint from: *Nature,* Vol. 166, p. 907, November 25, 1950. P.V. Grosjean was with the Institut Meteorologique, Leopoldville. [S13268] $ 25
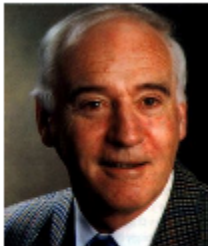
Lochlainn
O'Raifeartaigh

GRUBER, B. and O'RAIFEARTAIGH were both with the Dublin Institute for Advanced Studies. **O'RAIFEARTAIGH, Lochlainn** (1933-2000), Irish theoretical physicist. He is best remembered for the O'Rifeartaigh theorem, which was eventually generalized into the Coleman-Mandula theorem, and the O'Raifeartaigh Model of supersymmetry breaking. He was awarded the Wigner Medal in August 2000, just a few months before his death.

GRUBER, B.; O'RAIFEARTAIGH, Lochlainn. *Uniqueness of the harmonic Oscillator Commutation Relation.* Offprint from: *Proceedings of the Royal Irish Academy,* Volume 63, Section A, No. 5, pp. 69-73, March, 1964. Yellow printed wrappers. [S13269] $ 25

GUPTA, Suraj N.: (b. 1924), an Indian-American theoretical physicist known for his contribution to the quantum field theory. From that came the first attempts to derive the equations of general relativity from quantum field theory for a massless spin two particle (graviton). His work made contributions in various areas of quantum field theory and elementary particle physics, as well as quantum chromodynamics and quarkonium. Early in his career he was at the Cavendish Lab. Most recently he was professor at Wayne State University in Detroit where he is distinguished as Professor of Physics (Emeritus). [S13270]

[8 offprints] $ 200

1. **GUPTA, N. Suraj.** *Quantization of Einstein's Gravitational Field: Linear Approximation.* Offprint from: *Proceedings of the Physical Society,* A, vol. LXV, pp. 161-169, 1952. Signed by Pais.

2. **GUPTA, N. Suraj.** *Quantization of Einstein's Gravitational Field: General Treatment.* Offprint from: *Proceedings of the Physical Society,* A, vol. LXV, pp. 608-619, 1952. Signed by Pais. [Abstract: The approximate linear form of Einstein's gravitational field is quantized by using an indefinite metric. It is shown that only two types of gravitons can be observed, though many more can exist in virtual states in the presence of interaction. The observable gravitons are shown to be particles of spin 2. Using the interaction representation, the interaction of the gravitational field with the matter field is briefly discussed.]

3. **GUPTA, N. Suraj.** *Quantum Electrodynamics with Auxiliary Fields.* Offprint from: *Proceedings of the Physical Society,* A, vol. LXVI, pp. 129-138, 1953. Signed by Pais.

4. **GUPTA, N. Suraj.** *Fierz-Pauli Theory of Particles of Spin 3/2.* Offprint from: *The Physical Review,* vol. 95, no. 5, pp. 1334-1341, September 1, 1954. Signed by Pais.

5. **GUPTA, N. Suraj.** *Gravitation and Electromagnetism.* Offprint from: *The Physical Review,* vol. 96, no. 6, pp. 1683-1685, December 15, 1954. Signed by Pais. [Abstract: Einstein's theory of gravitation is compared with Maxwell's theory of the electromagnetic field, and some common features of the two theories are pointed out. It is also shown that the well-known peculiarities of Einstein's theory are a necessary consequence of the fact that Einstein's field corresponds to particles of spin 2.]

6. **GUPTA, N. Suraj; Barker, M. Bruce; Haracz, D. Richard.** *Meson Resonances and Nuclear Forces.* Offprint from: *The Physical Review,* vol. 142, no. 4, pp. 1144-1149, February 25, 1966.

7. **GUPTA, N. Suraj; Repko, W. Wayne.** *Electromagnetic Interaction of the Bargmann-Wigner Field with Spin ½.* Offprint from: *The Physical Review,* vol. 159, no. 5, pp. 1082-1083, July 25, 1967.

8. **GUPTA, N. Suraj; Repko, W. Wayne.** *Electromagnetic Interaction of the Bargmann-Wigner Fields.* Offprint from: *The Physical Review,* vol. 165, no. 5, pp. 1415-1419, January 25, 1968.

Feza Gürsey

GÜRSEY, Feza: (1921-1992), Turkish mathematician and theoretical physicist. While he did significant research in a number of different areas of physics, perhaps his most memorable contributions were the chiral model, which he introduced in 1960, and his work on the SU(6) GUT. Gürsey worked at the Brookhaven National Laboratory, the Institute for Advanced Study at Princeton, and Columbia University, before finally settling at Yale, where he spent the last 20 years of his life. [S13271]
[8 offprints] $ 450

1. **GÜRSEY, Feza**. *Relation of Charge Independence and Baryon Conservation to Pauli's Transformations.* Gürsey was with the Brookhaven National Laboratory, Upton, New York, pp.1-7, October 29, 1957. BNL 3418. Mimeograph format.

2. **GÜRSEY, Feza**. *General Relativistic Interpretation of Some Spinor Wave Equations.* Il Nuovo Cimento, Serie X, vol. 5, pp. 154-171, Gennaio 1957.

3. **GÜRSEY, Feza.** *Relativistic Kinematics of a Classical Point Particle in Spinor Form.* Il Nuovo Cimento, Serie X, vol. 5, pp. 784-809, Aprile 1957.

4. **GÜRSEY, Feza.** *On the Group Structure of Elementary Particles.* Offprint from: *Nuclear Physics* 8 (1958) pp. 675-691; North-Holland Publishing Co.; Amsterdam. Rubber stamped "Radiation Laboratory reprint number 242 University of California". Signed by Pais.

5. **GÜRSEY, Feza.** *On the Structure and Parity of Weak Interaction Currents.* Offprint from: *Annals of Physics,* vol. 12, no. 1, pp. 91-117, January 1961.

6. **GÜRSEY, Feza.** *Reformulation of General Relativity in Accordance with Mach's Principle.* Offprint from: *Annals of Physics,* vol. 24, pp. 211-242, October 196[3]. INSCRIBED TO PAIS FROM AUTHOR. Published date corrected in manuscript.

7. **GÜRSEY, Feza; CHANG, P.** *Non-Linear Lagrangian Models Invariant Under the Generalized Chiral Groups SL (4,C) and SL (12,C).* Offprint from: *Physics Letters,* vol. 26B, no. 8, pp. 520-523, March 18, 1968. Abstract: Non-linear Lagrangian models that generalize chiral π-N Lagrangians are presented. Exact SL(4, C) or SL (12.C) invariance holds respectively in the cases of no internal symmetry and SU(3) symmetry in the limit of zero meson masses. Mesons are SU(4) or SU(12) multiplets.

8. **GÜRSEY, Feza; Pais, Abraham.** *Speculations on CP-Invariance and the 2π-Modes of Long-Lived Neutral K-Particles.* From the Brookhaven National Laboratory, Upton, New York. 7 pp. Author's copy of the original typed paper.

Torsten Gustafson

GUSTAFSON, Torsten: (1904-1987), Swedish physicist, both studied and taught at Lund University. His research focus was first mechanics, and especially flow mechanics with aerodynamics and oceanography applications. While a PhD student, he worked as an assistant in the Swedish Hydrographic-Biological Commission in 1930-1934. Later he was mainly involved in nuclear physics. Torsten Gustafson was acquainted with Swedish Prime Minister Tage Erlander and served as Erlander's Informal Scientific Adviser both during his time as ecclesiastical minister and prime minister. In this capacity, Gustafson had an important role in the process, which led Sweden to focus early on nuclear research, including in the form of the Atomic Committee appointed in 1945, where Gustafson was a member. He was a member of the Council of CERN in Geneva in 1953-1964. [S13272] [3 offprints]

$ 125

o **GUSTAFSON, Torsten.** *On the Elimination of Divergencies in Quantum Field Theory.* From: *Kungl. Fysiografiska Sällskapets I Lund Förhandlingar,* Bd. 15, Nr. 28, 12 pp., 1945. Signed by Pais.

o **GUSTAFSON, Torsten.** *On the Elimination of Certain Divergencies in Quantum Electrodynamics.* From: *Arkiv för matematik, Astronomi och Fysik, Utgivet av, K. Svenska Vetenskapsakademien,* Band 34 A., no. 2, 9 pp., 1946. Signed by Pais.

o **GUSTAFSON, Torsten.** *On the Potential Collective Flow of a Rotating Nucleus with Non-Ellipsoidal Boundary.* From: *Det Kongelige Danske Videnskabernes Selskab, Matematisk-fysiske Meddelelser*, bind 30, nr. 5, 15 pp., 1955.

Rudolf Haag
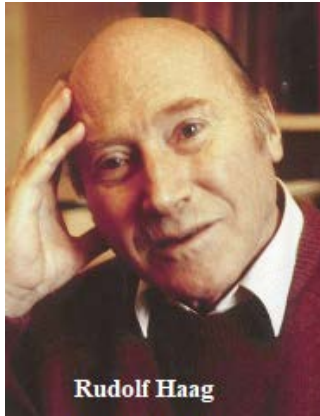
HAAG, Rudolf (1922-2016), German physicist, best known for his works in the algebraic formulation of axiomatic quantum field theory. Haag's theorem demonstrates the nonexistence of a unitary time-evolution operator in the interaction picture. He spent his early years at the Max Planck Institute, Princeton University, University of Marseille, and the University of Illinois, before taking the chair for theoretical physics at the University of Hamburg in 1966, where he remained until his retirement. He won the Max Planck Medal in 1970, and was an inaugural recipient of the Henri Poincaré Prize (presented by the International Association of Mathematical Physics) in 1997. [S13273] [5 offprints]

$ 300

1. **HAAG, Rudolf.** *Formale Korrespondenz, Faktorenreihenfolge und Poisson-Klammern.* Zeitschrift Für Naturforschung, band 7a, Heft 2, pp. 207-208, 1952. Signed by Pais.

2. **HAAG, Rudolf.** *Zur korrespondenzmäßigen Theorie der Spinwellengleichungen.* Zeitschrift Für Naturforschung, Band 7a, Heft 7, pp. 449-458, 1952. Signed by Pais.

3. **HAAG, Rudolf.** *Über die Objektivierbarkeit der Zustände in der nichtrelativistischen Quantenmechanik.* Zeitschrift Für Naturforschung, band 8a, Heft 1, pp.13-16, 1953. Signed by Pais.

4. **HAAG, Rudolf.** *On Quantum Field Theories.* Det Kongelige Danske Videnskabernes Selskab, Matematisk-fysiske Meddelelser, bind 29, nr. 12, pp. 1-37, 1955. Brown printed wrappers.

5. **HAAG, Rudolf.** *Die Selbstwechselwirkung des Elektrons.* Zeitschrift Für Naturforschung, Band 10a, Heft 9/10, pp. 752-761, 1955. Signed by Pais.
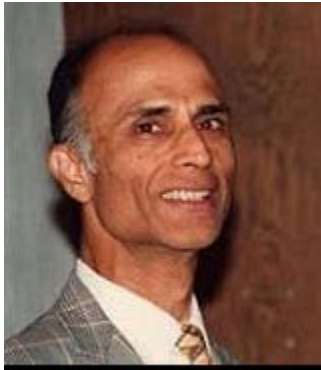
Harish-Chandra

HARISH-CHANDRA: (1923-1983), an Indian American mathematician and physicist who worked on harmonic analysis and representation theory. A Fellow of the Royal Society and member of the National Academy of Sciences, he received the Cole Prize in 1954 for his work on semisimple lie groups, and the Srinivasa Ramanujan medal in 1974 for achievement in mathematics.
[7 offprints] [S13274]

$ 650

1. **HARISH-CHANDRA.** *On the removal of the infinite self-energies of point-particles.* Offprint from: *Proceedings of the Royal Society,* A, vol. 183, pp. 142-167, 1944. Signed by Pais.

2. **HARISH-CHANDRA** (1923-1983); **BHABHA, Homi Jehangir** (1909-1966)**.** *On the theory of point-particles.* Offprint from: *Proceedings of the Royal Society,* A, vol. 183, pp. 134-141, 1944. Signed by Pais. NOTE: Homi Jehangir Bhabha (1909 – 1966) was an Indian nuclear physicist, founding director, and professor of physics at the Tata Institute of Fundamental Research. Colloquially known as "father of the Indian nuclear programme", Bhabha was the founding director of two well-known research institutions, namely the Tata Institute of Fundamental Research (TIFR) and the Trombay Atomic Energy Establishment (now named after him); both sites were the cornerstone of Indian development of nuclear weapons which Bhabha also supervised as its director. He was elected a Fellow of the Royal Society in 1941. Bhabha died tragically on an air crash near Mount Blanc, Switzerland. – Wikip. Harish-Chandra, Fellow of the Royal Society (1923 – 1983) was an Indian American mathematician and physicist who did fundamental work in representation theory, especially harmonic analysis on semisimple Lie groups. – Wikip.

3. **HARISH-CHANDRA; Bhabha, H. J.; F.R.S.** *On the fields and equations of motion of point particles.* Offprint from: *Proceedings of the Royal Society,* A, vol. 185, pp. 250-268, 1946. Signed by Pais.

4. **HARISH-CHANDRA; Bhabha, H. J.** *On the equations of motion of point particles.* Offprint from: *Proceedings of the Royal Society,* A, vol. 185, pp. 269-287, 1946. Signed by Pais.

5. **HARISH-CHANDRA.** *Infinite irreducible representations of the Lorentz group.* Offprint from: *Proceedings of the Royal Society,* A, vol. 189, pp. 372-401, 1947. Signed by Pais.

6. **Harish-Chandra.** *On Relativistic Wave Equations.* Offprint from: *The Physical Review,* nol. 71, no. 11, pp. 793-805, June 1, 1947. Signed by Pais.

7. **Harish-Chandra.** *The correspondence between the particle and the wave aspects of the meson and the photon.* Offprint from: *Proceedings of the Royal Society,* A, Vol. 186, pp. 502-525. Signed by Pais.

Peter Havas

HAVAS, Peter: (1916-2004). Hungarian-American theoretical physicist who mainly worked in classical filed theories and general relativity theory.

[5 offprints] SOLD

1. **HAVAS, P.** *Relativity and Causality.* Offprint from: *Proceedings of the 1964 International Congress for Logic, Methodology and Philosophy of Science Held in Jerusalem,* pp. 347-362, August 26-September 2, 1964. Original light blue printed wrappers.

2. **HAVAS, P.** *The Connection between Conservation Laws and Laws of Motion in Affine Spaces.* Offprint from: *Journal of Mathematical Physics,* vol. 5, no. 3, pp. 373-378, March 1964.

3. **HAVAS, P.** *Some Basic Problems in the Formulation of a Relativistic Statistical Mechanics of Interacting Particles.* Offprint from: *Statistical Mechanics of Equilibrium and Non-Equilibrium,* North-Holland Publishing

Company-Amsterdam, pp.1-19, 1965. Department of Physics, Lehigh University, Bethlehem, Pennsylvania. Original blue printed wrappers.

4. **HAVAS, P.** *A Note on Hertz's "Derivation" of Maxwell's Equations.* Offprint from: *American Journal of Physics,* vol. 34, no. 8, pp. 667-669, August 1966. Original orange printed wrappers.

5. **HAVAS, P.** *Are Zero Rest Mass Particles Necessarily Stable?* Offprint from: *American Journal of Physics,* vol. 34, no. 9, part 1, pp. 753-757, September 1966. Original orange printed wrappers.

Erwin N. Hiebert

HIEBERT, Erwin N. (1919-2012), science historian, chaired the Department of the History of Science at the University of Wisconsin from 1960-1965 and at Harvard from 1977-1984. Originally a working scientist, Hiebert transition to history after finding himself troubled by the relationship between science and the nuclear arms race. His scholarship focused on the history of chemistry and the physical sciences, the relations between science and religion, and the scientific philosophies of various major scientists, especially those operating in the German-speaking world in th elate 19th and early 20th century. [S13276]

[3 offprints] $ 50

1. **HIEBERT, N. Erwin.** *The Genesis of Mach's Early Views on Atomism.* Offprint from: Boston Studies in the Philosophy of Science, vol. VI, *Ernst Mach, Physicist and Philosopher,* edited by Robert S. Cohen and Raymond J. Seeger, vol. 6, pp. 79-106, [1970]. Original light blue printed wrappers.

2. **HIEBERT, N. Erwin.** *Book Reviews—ISIS, 65 2 227 (1974). J. Bradley. Mach's Philosophy of Science? pp. 253-256.*

3. **HIEBERT, N. Erwin.** *Ernst Mach.* From: *Dictionary of Scientific Biography,* vol. VII, pp. 595-607. Original pale green printed wrappers.

HYLLERAAS, Egil A.: (1898-1965). A distinguished Norwegian theoretical physicist known for his simple yet elegant method for predicting the ground state energy of two-electron atoms as well as trial wave functions for many-electron atoms. "When Bohr's student became ill, he was assigned the urgent task of working on the helium problem. Hylleraas modified the first attempt in two important ways: he replaced the incomplete bound-state hydrogenic functions by the complete Laguerre functions and reduced the number of co-ordinates from 6 to 3, namely the distances of the two electrons from the nucleus and the angle between the position vectors of the two electrons. Then, with the aid of a mechanical desk calculator obtained result in much better agreement. The result was well received but the discrepancy of 0.12 eV continued to bother him. Later in 1928, a breakthrough was achieved when he realized the angle co-ordinate should be replaced by the distance between the two electrons. With only three terms in the wave function expansion, the error had been reduced to 0.03 eV, with six terms to 0.01 eV. His work was quickly applied to other two-electron atoms and to the hydrogen molecule"-Wiki. [S13277]

[9 offprints] $ 650

1. **HYLLERAAS, Egil A.** *Die Elektronenaffinität des Wasserstoffatoms nach der Wellenmechanik.* Zeitschrift Für Physik, Sonderabdruck 60. Band. 9. und 10. Heft. pp. 624-630. Verlag von Julius Springer, Berlin 1930.

2. **HYLLERAAS, Egil A.** *Die Wellengleichung des Keplerproblems im Impulsraume.* Zeitschrift Für Physik, Sonderabdruck 74. Band. 3. 4. Heft. pp. 216-224. Verlag von Julius Springer, Berlin 1932. Rubber stamped; Publikasjoner fra Chr. Michelsens Institutt nr. 11.

3. **HYLLERAAS, Egil A.** *Zur Konvergenzfrage gewisser Näherungslösungen der ,,äußeren" Gleichung des Zweizentrenproblems. Zeitschrift Für Physik,* Sonderabdruck 93. Band. 9. und 10. Heft. pp. 582-588. Verlag von Julius Springer, Berlin 1935.

4. **HYLLERAAS, Egil A.** *Analytische Darstellung von Potentialen zweiatomiger Moleküle und ihre Bestimmung aus spektroskopischen Daten. 1. Teil. Allgemeine Theorie.* Zeitschrift Für Physik, Sonderabdruck

96. Band. 9. und 10. Heft. pp. 643-660. Verlag von Julius Springer, Berlin 1935.

5. **HYLLERAAS, Egil A.** *Potential Walls and the So-Called Klein Paradox in Relativistic Quantum Mechanics.* Avhandlinger Utgitt Av Det Norske Videnskaps-Akademi I Oslo; I. Mat.-Naturv. Klasse 1943. No. 2, pp. 1-9, 1943. Original light purple printed wrappers.

6. **HYLLERAAS, Egil A.** *On the Solution of the Relativistic Wave Equation for an Electron in a Coulomb Field.* Avhandlinger Utgitt Av Det Norske Videnskaps-Akademi I Oslo; I. Mat.-Naturv. Klasse 1943. No. 1, pp. 1-15, 1943. Original light purple printed wrappers.

7. **HYLLERAAS, Egil A.** *Evaluation of Transition Probabilities for Non-Coulombian Central Fields.* Archiv For Mathematik Og Naturvidenskab. B. XLVIII, Nr. 4, pp. 1-32, 1945. Original beige printed wrappers. Signed by Pais.

8. **HYLLERAAS, Egil A.** *Construction of Differential Equations from their Eigenvalues.* Meddelelser Fra Universitetets Fysiske Institutt OSLO, Nr. 143, Hefte 2, pp. 84-88, 1948. Original orange printed wrappers. Signed by Pais.

9. **HYLLERAAS, Egil A.** *Calculation of a Perturbing Central Field of Force from the Elastic Scattering Phase Shift.* Meddelelser Fra Universitetets, Fysiske Institutt, OSLO, Nr. 137. Offprint from: *The Physical Review,* vol. 74, no. 1, pp 48-51, July 1, 1948. Original green printed wrappers. Signed by Pais.

IKEDA, Mineo (1926-1983), a physicist at the Research Institute for Theoretical Physics at Hiroshima University. This collection includes "On Spherical Functions for the Unitary Group, I-IV." [S13278]

[7 offprints] $ 250

1. **IKEDA, Mineo; MAEKAWA, Takayoshi; MIYACHI, Yoshihiko; SENBA, Kei; SHOHNO, Naomi.** *On Bound States in the Full Symmetry Theory.* Offprint from: *Progress of Theoretical Physics,* vol. 31, no. 2, pp. 235-246, February 1964. Abstract: The approach which was proposed in a previous paper for treating the problem of bound states, is extended to the case where there are three kinds of basic particles; proton, neutron

and A-particle. A general form of a four-Fermion interaction is obtained by assuming the full symmetry among the basic particles. Then, the particle-antiparticle two-body system is discussed in the vector coupling which contains a form factor, and the integral equations in the momentum representation are derived. Solutions are obtained in the special case of contact interaction.

2. **IKEDA, Mineo.** *Sur une Généralisation de la Fonction Sphérique Complexe.* Offprint from: *Progress of Theoretical Physics,* vol. 34, no. 4, pp.695-6, Juin 28, 1965.

3. **IKEDA, Mineo.** *On the Mathematical Foundation of the Symmetry Theory of Elementary Particles. –The Case of Simple Lie Groups of Rank Two-.* Offprint from: *Memoirs of the Faculty of Engineering,* Hiroshima University, vol. 3, no. 1, pp. 1-16, August 1967.

4. **IKEDA, Mineo.** *On Spherical Functions for the Unitary Group, I. –General Theory-.* Offprint from: *Memoirs of the Faculty of Engineering,* Hiroshima University, vol. 3, no. 1, pp. 17-29, August 1967. Signed by Pais.

5. **IKEDA, Mineo.** *On Spherical Functions for the Unitary Group, II. –The Case of Two Dimensions-.* Offprint from: *Memoirs of the Faculty of Engineering,* Hiroshima University, vol. 3, no. 1, pp. 31-53, August 1967. Signed by Pais.

6. **IKEDA, Mineo.** *On Spherical Functions for the Unitary Group, III. –The Case of Three Dimensions-.* Offprint from: *Memoirs of the Faculty of Engineering,* Hiroshima University, vol. 3, no. 1, pp. 55-75, August 1967. Signed by Pais.

7. **IKEDA, Mineo; Kayama, Tokuichi.** *On Spherical Functions for the Unitary Group, IV. –The Case of Higher Dimensions-.* Offprint from: *Memoirs of the Faculty of Engineering,* Hiroshima University, vol. 3, no. 1, pp. 77-100, August 1967. Signed by Pais.

JEHLE, Herbert (1907-1983), German physicist, known for his work on two-component field equations. Educated at the Institute of Technology in Stuttgart, Jehle was a conscientious objector to the Nazism, and was interned in multiple concentration camps in Vichy France from 1940-41 before fleeing to the U.S., where he joined a group of refugee instructors teaching at Harvard. After the war, Jehle worked for a number of institutions, including the University of Pennsylvania and Caltech, before joining the faculty at George Washington University in 1959. [S13279]

[3 offprints] $ 150

1. **JEHLE, Herbert; Bade, W. L.** *An Introduction to Spinors.* Offprint from: *Reviews of Modern Physics,* vol. 25, no. 3, pp. 714-728, July 1953. Signed by Pais.

2. **JEHLE, Herbert; Cahn, H. Julius.** *Anharmonic Resonance.* Offprint from: *American Journal of Physics,* vol. 21, no. 7, pp. 526-531, October 1953. Signed by Pais. ABSTRACT: The oscillations of a pair of classical oscillators which are synchronized because of anharmonic resonance can be calculated by the method of variation of constants. Two types of motion are studied: librational and nonlibrational—referring to oscillatory and progressive behavior, respectively, of the phase difference of the two oscillators. These motions are exemplified by the corresponding motion of a rod pendulum. Conditions for prolonged persistence of librational motion are discussed. This paper is essentially a review of some of E. W. Brown's papers on nonlinear resonance.

3. **JEHLE, Herbert; Parke William C.** *Relationship of the Foldy-Wouthuysen Transformation to Lorentz Transformations.* Offprint from: *The Physical Review,* vol. 137, no. 3B, B760-B762, February 8, 1965. ABSTRACT: The covariant spinor formalism of Infeld and van der Waerden and of Uhlenbeck and Laporte permits a simple interpretation of the relationship between a Foldy-Wouthuysen transformation for a free particle and an associated pair of Lorentz transformations.

KAC, Mark: (1914-1984). Kac completed his Ph.D. in mathematics at the University of Lwów, Poland, in 1937 under the direction of Hugo Steinhaus. In the year 1951–1952 at Cornell University, Kac was on sabbatical at the Institute for Advanced Study. In 1952, Kac, with Theodore H. Berlin, introduced the spherical model of a ferromagnet (a variant of the Ising model) and, with J. C. Ward, found an exact solution of the Ising model using a combinatorial method. I feel like this needs more.

See: H.P. McKean, "Mark Kac, 1914-1984," *National Academy of Sciences, Biographical Memoir*, WDC, 1990. [S13280]
[27 offprints] $ 1,500

1. **KAC, Mark; Hurwitz, H.** *Statistical Analysis of Certain Types of Random Functions.* Offprint from: *The Annals of Mathematical Statistics,* Vol. XV, No. 2, pp. 173-181, June, 1944. Signed by Pais.

2. **KAC, Mark.** *On the Notion of Recurrence in Discrete Stochastic Processes.* Offprint from: *The Bulletin of the American Mathematical Society,* Vol. 53, No. 10, pp. 1002-1010, October, 1947. Signed by Pais.

3. **KAC, Mark; Erdös, P.** *On the Number of Positive Sums of Independent Random Variables.* Offprint from: *Bulletin of the American Mathematical Society,* Vol. 53, No. 10, pp. 1011-1020, October, 1947. Original grey printed wrappers. Signed by Pais.

4. **KAC, Mark; Siegert, J. F.** *An Explicit Representation of a Stationary Gaussian Process.* Offprint from: *The Annals of Mathematical Statistics,* Vol. XVIII, No. 3, pp. 439-442, September, 1947. Signed by Pais.

5. **KAC, Mark.** *Random Walk and the Theory of Brownian Motion.* [Errata sheet laid in]. Offprint from: *The American Mathematical Monthly,* Vol. LIV, No. 7, August-September, 1947. Original light blue printed wrappers. Signed by Pais.

6. **KAC, Mark; Siegert, J. F.** *On the Theory of Noise in Radio Recievers with Square Law Detectors.* Offprint from: *Journal of Applied Physics,* Vol. 18, No. 4, pp. 383-397, April, 1947. Signed by Pais.

7. **KAC, Mark.** *On the Characteristic Functions of the Distributions of Estimates of Various Deviations in Samples from a Normal Population.* Offprint from: *The Annals of Mathematical Statistics,* Vol. XIX, No. 2, pp. 257-261, June, 1948. Signed by Pais.

8. **KAC, Mark.** *Probability Methods in some Problems of Analysis and Number Theory.* Offprint from: *Bulletin of The American Mathematical Society,* Vol. 55, No. 7, pp. 641-665, July, 1949.

9. **KAC, Mark.** *On the Distributions of Certain Wiener Functionals.* Offprint from: *Transactions of The American Mathematical Society,* Vol. 65, No. 1, pp. 1-13, January, 1949. Original light blue printed wrappers.

10. **KAC, Mark.** *The Monte Carlo Method and its Applications.* Offprint from: *Proceedings, Computation Seminar,* pp. 74-81, December, 1949. Original grey printed wrappers. Signed by Pais.

11. **KAC, Mark; Donsker, M. D.** *A Sampling Method for Determining the Lowest Eigenvalue and the Principal Eigenfunction of Schrödinger's Equation.* Offprint from: *the Journal of Research of the National Bureau of Standards; U.S. Department of Commerce, National Bureau of Standards.* Research Paper RP2102, Volume 44, pp. 551-557, May 1950.

12. **KAC, Mark; Berlin, T. H.** *The Spherical Model of a Ferromagnet.* Offprint from: *The Physical Review,* Vol. 86, No. 6, pp. 821-835, June 15, 1952.

13. **KAC, Mark; Murdock, W. L.; Szegö, G.** *On the Eigen-valves of Certain Hermitian Forms.* Offprint from: *Journal of Rational Mechanics and Analysis,* Vol. 2, No. 4, pp.767-800, October, 1953.

14. **KAC, Mark.** *Signal and Noise Problems.* Offprint from: *The American Mathematical Monthly,* Vol. LXI, No. 7, August-September, 1954. Original light blue printed wrappers.

15. **KAC, Mark.** *Foundations of Kinetic Theory.* Offprint from: *Proceedings of the Third Berkley Symposium on Mathematical Statistics*

and Probability, pp. 171-197, December, 1954, and June and July, 1955. Grey printed wrappers.

16.   **KAC, Mark.** *Distribution of Eigenvalues of Certain Integral Operators.* From: *The Michigan Mathematical Journal,* Vol. 3, pp. 141-148, 1955-56. Original printed wrappers.

17.   **KAC, Mark; Darling, D. A.;** *On Occupation Times for Markoff Processes.* Offprint from: *Transactions of the American Mathematical Society,* Vol. 84, No. 2, pp. 444-458, March 1957. Original light blue printed wrappers.

18.   **KAC, Mark.** *A Class of Limit Theorems.* Offprint from: *Transactions of the American Mathematical Society,* Vol. 84, No. 2, pp. 459-471, March 1957. Original light blue printed wrappers.

19.   **KAC, Mark; Kesten, Harry.** *On Rapidly Mixing Transformations and an Application to Continued Fractions.* Offprint from: *Bulletin of the American Mathematical Society,* Vol. 64, No. 5, pp. 283-287, September 1958. Original green printed wrappers.

20.   **KAC, Mark.** *On the Partition Function of a One-Dimensional Gas.* Offprint from: *The Physics of Fluids,* Volume 2, Number 1, pp. 8-12, January-February, 1959.

21.   **KAC, Mark.** *Mathematics, Its Trends and Its Tensions. Occasional Papers of The Rockefeller Institute.* New York: Rockefeller Institute, 1961. 8 pp. Signed by Pais.

22.   **KAC, Mark.** *Probability; The real world confronts the mathematician with events that are not strictly predictable. The methods he has developed to deal with such events have opened new domains of pure mathematics.* From: *Scientific America.* September, 1964, Vol. 211, No. 3, pp. 91-106. Original printed wrappers.

23.   **KAC, Mark.** *The Work of T. H. Berlin in Statistical Mechanics—A Personal Reminiscence.* Offprint from: *Physics Today,* pp. 39-42, October 1964.

24.   **KAC, Mark.** *Can One Hear the Shape of a Drum?* Offprint from: *American Mathematical Monthly,* Vol. 73, No. 4, Part II, pp. 1-23, April,

1966. Original light blue printed wrappers. "His main interest was probability theory. His question, "Can one hear the shape of a drum?" set off research into spectral theory, with the idea of understanding the extent to which the spectrum allows one to read back the geometry. (In the end, the answer was "no", in general) For the 1966 paper that made the question famous, Kac was given the Lester R. Ford Award in 1967 and the Chauvenet Prize in 1968."- Wikip.

25.   **KAC, M.; Luttinger, J. M.** *A Formula for the Pressure in Statistical Mechanics.* Offprint from: *J. Math. Phys.,* Vol. 14, No. 5, pp. 583-85, 1973.

26.   **KAC, Mark.** Marginalia. *Dehydrated elephants revisited.* Offprint from: *American Scientist,* pp. 633-634, November-December 1982. Original black pictorial wrappers. INSCRIBED BY THE AUTHOR "To Bram pour s'amuse" – to Abraham Pais.

27.   **KAC, Mark.** *A Note on Eigenvalues and Eigenfunctions of the Laplace Operator. From: Department of Mathematics, Cornell University, and the National Bureau of Standards.* 6 pp. The Preparation of this paper was sponsored (in part) by the Office of Naval Research. Occasional handwritten corrections.

Claude Kacser

KACSER, Claude: (1934-) born as Claus Katchum in Paris, France, [A Jewish refugee, left Nazi Germany who survived the holocaust, ...] Presently Professor Emeritus at the University of Maryland, Dept. of Physics. Kacser worked at CERN. [S13281]
[1 offprint] $ 35

o **KACSER, Claude.** *Theoretical and Experimental Relationship between Triangle Singularities, Peierls Mechanism, and Resonance Poles.* Offprint from: *Physics Letters,* Volume 12, number 3, pp. 269-272, 1 October 1964. CERN.

KARPLUS, Robert: (1927-1990). Was a theoretical physicist and leader in the science education field. Early in his physics career, Karplus became interested in developing the theory of quantum electrodynamics while working at Princeton. Due to the ambiguities and complexity of QED, no one had so far been able to do such a calculation. Karplus while in collaboration with Norman Kroll, used QED to calculate the value of the magnetic moment of the electron. This was an extremely rigorous calculation, requiring more than a year of intense efforts from both men; the agreement of their result and the experimental measurements was the first serious confirmation of QED. [S13284]

$ 350

o **KARPLUS, Robert; KROLL, Norman.** *Fourth-Order Corrections in Quantum Electrodynamics and the Magnetic Moment of the Electron.* Offprint from: *The Physical Review,* Vol. 77, No. 4, pp. 536-549, February 15, 1950. Signed by Pais. This is one of the first significant papers to use Feynman diagrams in QED calculations, two years after Feynman first demonstrated their utility.

KASTELEYN, Pieter W. (1924-1996), Dutch physicist, renowned for contributions he made in statistical mechanics. After the war, Leiden University reopened and he undertook the study of physics, graduating in 1951. He defended his Ph.D. thesis working under S.R. de Groot in 1956. By 1963, Kasteleyn was nominated Full Professor at the Lorentz Institute of Theoretical Physics in Leiden. From 1978 to 1984 he was chairman of the Commission for Theoretical Physics of the Dutch National Physics Foundation. He retired in 1985. [S13285]

o **KASTELEYN, P. W.** *Phase Transitions.* Offprint from: *Fundamental Problems in Statistical Mechanics II.* Amsterdam: North-Holland, 1968. pp. 30-70.

$ 25

KAUFMAN, Bruria: (1918-2010), Israeli theoretical physicist who is known for her contributions to Albert Einstein's general theory of relativity, and statistical physics, where she used applied spinor analysis to rederive the results of Lars Onsager on the partition function of the two-dimensional Ising Model, and to the study of the Mössbauer effect, on which she collaborated with John von Neumann and Harry Lipkin. She studied mathematics at the Hebrew University of Jerusalem in 1938 then at Columbia in 1948 for her PhD. [S13287]

KAUFMAN, Bruria. *Crystal Statistics. II. Partition Function Evaluated by Spinor Analysis;* [and] *Crystal Statistics. III. Short-Range Order in a Binary Ising Lattice.* Offprint from: *The Physical Review,* Vol. 76, No. 8, pp. 1232-1252, October 15, 1949. Original turquoise printed wrappers. [Abstract: "The partition function for a two-dimensional binary lattice is evaluated in terms of the eigenvalues of the 2 n-dimensional matrix V characteristic for the lattice. Use is made of the properties of the 2 n-dimensional" spin"-representation of the group of rotations in 2 n- dimensions. In consequence of these properties, it is shown that the eigenvalues of V are known as soon as one knows the angles of the 2n-dimensional rotation represented by V. Together with the eigenvalues of V, the matrix Ψ which diagonalizes V is obtained as a spin-representation of a known rotation. The determination of Ψ is needed for the calculation of the degree of order. The approximation, in which all the eigenvalues of V but the largest are neglected, is discussed, and it is shown that the exact partition function does not differ much from the approximate result." $ 45

KEMMER, Nicholas: (1911-1998). A Russian-British nuclear physicist who played a key role in the United Kingdom's nuclear program. He received his doctorate in nuclear physics at the University of Zurich and worked as an assistant to Wolfgang Pauli. Kemmer also suggested the names Neptunium for the new element 93 and Plutonium for 94 by analogy with the outer planets Neptune and Pluto beyond Uranus. [S13288]

[4 offprints; 1 'copied' paper] $ 250

1. **KEMMER, Nicholas.** *Quantum Theory of Einstein-Bose particles and nuclear interaction.* Reproduced from [not an offprint]: *Proceedings of the Royal Society of London,* Vol. CLXVI, pp. 127-153, 1938. Appears to be reproduced – similar to a modern photocopy. This copy, however, shows a physicist's corrections or annotations on 4 facing leaves. Kemmer knew Abraham Pais, yet we cannot be sure whose handwriting is responsible for this notes.

2. **KEMMER, Nicholas.** *The Particle Aspect of Meson Theory.* Offprint from: *Proceedings of the Royal Society of London,* Series A, No. 952, vol.173, pp.91-116, November 1939. Signed by Pais.

3. **KEMMER, Nicholas Polkinghorne, J. C.; Pursey, D. L.** *Invariance in Elementary Particle Physics.* Offprint from: *Reports on Progress in Physics,* Vol. XXII, p. 368-432, 1959. Signed by Pais. NOTE: A copy of a typed letter, HAND-SIGNED BY KEMMER, and addressed by hand to Pais, is included.

4. **KEMMER, Nicholas.** *The Impact of Yukawa's Meson Theory on Workers in Europe – A Reminiscence.* Offprint from: *Progress of Theoretical Physics*, pp. 602-608, 1965.

5. **KEMMER, Nicholas; Ludwig, G.** *Über die Lichtstreuung an elektrischen Feldern nach der Theorie des Positrons. II.* Offprint from: *Helvetica Physica Acta,* Volumen X, Fasciculus Tertius. pp. 182-184. Signed by Kemmer.

KIKUTA, Takashi. Kikuta was, at the time of these papers publication, doing research at the University of Tokyo. [S13289]

[5 offprints] $ 225

1. **KIKUTA, Takashi.** *Convergence of Iterative Methods.* Offprint from: *Progress of Theoretical Physics,* Vol. 10, No. 6, pp. 653-672, December 1953. Signed by Pais.

2. **KIKUTA, Takashi.** *Upper and Lower Bounds of Born Approximation, I.* Offprint from: *Progress of Theoretical Physics,* Vol. 12, No. 2, pp. 225-233, August, 1954. Signed by Pais.

3. **KIKUTA, Takashi.** *Upper and Lower Bounds of Born Approximation, II.* Offprint from: *Progress of Theoretical Physics,* Vol. 12, No. 2, pp. 234-240, August, 1954. Signed by Pais.

4. **KIKUTA, Takashi.** *Super-stationary Variational Method.* Offprint from: *Progress of Theoretical Physics,* Vol. 12, No. 1, pp. 10-16, July, 1954. Signed by Pais.

5. **KIKUTA, Takashi.** *A Variation Principle in Deuteron Problem.* Offprint from: *Progress of Theoretical Physics,* Vol. 11, Nos. 4~5, pp. 493-494, April-May 1954. Signed by Pais.

Toichiro Kinoshita

KINOSHITA, Toichiro: Tōichirō Kinoshita (木下東一郎, Kinoshita Tōichirō ; b. 23 January 1925 in Tokyo) is a Japanese theoretical physicist. Kinoshita studied physics at the University of Tokyo, where he in 1947 earned his baccalaureate degree and in 1952 attained a doctorate. Afterwards he spent two years as a postdoc at the Institute of Advanced Study and in 1954 at Columbia University. Starting from 1954 he was at Cornell University, 1955 as assistant professor, 1958 as associate professor and starting from 1960 as a full professor (starting from 1992 as Goldwin Smith professor) at Newman Laboratory of Nuclear Studies of Cornell University. In 1962-63 he was a Ford Fellow at CERN. In 1995 he retired from Cornell as professor emeritus. He was a guest professor at the University of Tokyo, at CERN, and at the national laboratory for high-energy physics KEK in Japan. Kinoshita is known for his extensive precision computations of fundamental quantities in quantum electrodynamics. The fundamental quantities involved electroweak theory and corrections related to the Standard Model, such as the anomalous magnetic moments of both the electron and the muon and the spectra of positronium and muonium, which made possible far more exact comparisons between theory and experiment. In 1962 he introduced the Kinoshita-Lee-Nauenberg theorem. In the 1970s he worked on quantum chromodynamics and quarkonium - spectroscopy with Estia Eichten, Kenneth Lane, Kurt Gottfried. In 2001 Kinoshita had to admit there was an error in his computation of the anomalous magnetic moment of the muon, after experiments at Brookhaven, they discovered a discrepancy in the 9th to-right-

of-the-decimal-point position — leading many to believe that experimental evidence had revealed "new physics". However, in Marseille a group examined Kinoshita's calculation in explicit detail and found that the error resulted from a sign error within the computers algebra program used for the original calculation. When the software was debugged, the issue was resolved. In 1973-1974 Kinoshita was a Guggenheim Fellow, he received the Sakurai prize in 1990, and in 1991 became a member of National Academy of Sciences.

[5 offprints] [S13290] $ 250

1. **KINOSHITA, Toichiro.** *On the Interaction of Mesons with the Electromagnetic Field. I.* From: *Progress of Theoretical Physics,* Vol. V, No. 3, pp. 473-488, May-June, 1950.

2. **KINOSHITA, Toichiro.** *Effect of Coulomb Barrier on Meson Production by Nucleon-Nucleus Collisions.* Offprint from: *The Physical Review,* Vol. 94, No. 5, pp. 1331-1334, June 1, 1954. Signed by Pais.

3. **KINOSHITA, Toichiro.** *V Particles and the Gamma Decay of a Neutral Pion.* Offprint from: *The Physical Review,* Vol. 94, No.5, pp. 1384-1385, June 1, 1954. Signed by Pais.

4. **KINOSHITA, Toichiro.** *Families of Spinor Fields.* Offprint from: *The Physical Review,* Vol. 96, No. 1, pp. 199-201, October 1, 1954. Signed by Pais.

5. **KINOSHITA, Toichiro; Brodsky, S. J.; Terazawa, Hidezumi.** *Deep Inelastic Scattering of Electrons on a Photon Target.* From: *Physical Review Letters,* Volume 27, Number 5, pp. 280-283, 2 August 1971.

David A. Kirzhnits

KIRZHNITS, David Abramovich: (1926-1998). Russian scientist, graduated from Moscow University. He has been connected with the theoretical physics department since. Kirzhnits invented the theory of cosmological phase transitions in particle theories with spontaneous symmetry breaking. This theory has radically changed our views on the physical processes in the early universe. In particular, this theory is the basis of inflationary cosmology and of the theory of cosmic strings. In 1978 D.A. Kirzhnits and A.D. Linde were

awarded the M.V. Lomonosov Prize of the Academy of Sciences of the USSR for these studies. [S13291]

[2 papers] $ 50

1. **KIRZHNITS, D. A.** *Nonuniqueness of the Solutions of the Scattering Problem.* Offprint from: *Soviet Physics Jept,* volume 22, number 5, pp. 1059-1066, May, 1966.

2. **KIRZHNITS, D. A.** *Field Theory with Nonlocal Interaction. I. Construction of the Unitary S Matrix; II. The Dynamical Apparatus of Theory; III. Diagram Technique; ; IV. Questions of Convergence; .* Offprint from: *Soviet Physics Jetp,* volume 14, number 2, February 1962 – volume 20, number 2, August 1965. 32 pp.

KLEIN, Abraham: (1927-2003). American theoretical physicist, his studies took him to Brooklyn College then to Harvard where he obtained his masters and doctorate in 1950 under Julian Schwinger. [S13292]

Abraham Klein

[3 offprints] $ 100

1. **KLEIN, Abraham.** *Convergence of the Adiabatic Nuclear Potential. II.* Offprint from: *The Physical Review,* Vol. 92, No. 4, pp. 1017-1020, November 15, 1953. Signed by Pais.

2. **KLEIN, Abraham.** *The Construction of Potentials in Quantum Field Theory.* Offprint from: *The Physical Review,* Vol. 91, No. 5, p. 1285, September 1, 1953. Signed by Pais.

3. **KLEIN, Abraham.** *Invariant Operators of the Unitary Unimodular Group in n Dimensions.* Offprint from: *Journal of Mathematical Physics,* Volume 4, Number 10, pp. 1283-1284, October 1963.

Nathan S. Kline

KLINE, Nathan Schellenberg (1916-1983). American scientist and psychology researcher. One of only two winners of the Albert Lasker Award for Clinical Medical Research, Kline was a pioneer in the field of psychopharmacology. He spent most of his life working at the Rockland Research Institute, which, upon his death, was renamed the Nathan Kline Institute for Psychiatric Research. [S13286]

o **KLINE, Nathan S.** *You Can't Get There From Here.* Offprint from; *The Indian Journal of Psychiatry,* Vol. 1, No. 3, pp. 118-125, April, 1959. Original red, white, blue printed wrappers. $ 20

Kobayasi (far right) with R. Feynman And Hideki Yukawa

KOBAYASI, Minoru. Kobayasi was a Japanese theoretical nuclear physicist. A student of Yoshio Nishina, he received his Ph.D. from Osaka University in 1941, and worked at the Institute for Advanced study from 1954-1955. Eventually he became a professor of theoretical physics at Kyoto University. [S13293]

[2 offprints] $ 175

1. **KOBAYASI, Minoru; Okayama, Taisuke.** *On the Creation and Annihilation of Heavy Quanta in Matter.* Offprint from; *Proceedings of the Physico-Mathematical Society of Japan,* 3rd Ser; [B], Vol. 21, No. 1, pp. 1-13, January 1939. Original grey printed wrappers.

2. **KOBAYASI, Minoru; TAKAGI, Shûji; SAWADA, Katurô.** *Notes on the Self-Energy Problems.* Offprint from: *Progress of Theoretical Physics,* Vol. IV, No. 1, pp. 71-81, Jan-Mar., 1949. Signed by A. Pais.

KOFOED-HANSEN, Otto (1921-1990). Danish physicist, Kofoed-Hansen was the first head of the physics department oat the Danish research center Risø, and a professor of physics at the Technical University of Demark in Lyngby. From 1960 to 1968 he was senior physicist at CERN. [S13295]

KOFOED-HANSEN, Otto. *Neutrino Recoil Experiments.* Offprint from *Beta- And Gamma-Ray Spectroscopy,* North-Holland Publishing Company, Amsterdam, 1955. pp. 357-372. Signed by A. Pais. $ 25


Michiji Konuma

KONUMA, Michiji (b. 1931). Japanese physicist, received his PhD from the University of Tokyo in 1958, taught physics primarily at Keio University in Yokohama. [S13296] $ 20

KONUMA, Michiji; REMIDDI, Ettore. *Antiproton-Proton Annihilation at rest into two Pseudoscalar Mesons and SU (6) Symmetry.* Offprint from: *Physical Review Letters,* Volume 14, Number 26, pp. 1082-83, June 28, 1965. K520 1-2. Physics equation annotated in ink.
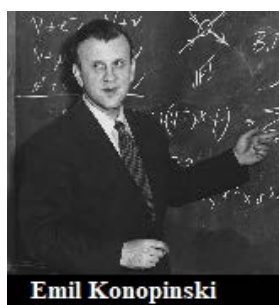
Emil Konopinski

KONOPINSKI, Emil John (Jan) (1911-1990). An American nuclear scientist. During WW II Konopinski collaborated with Enrico Fermi on the first nuclear reactor at the University of Chicago as part of the Manhattan Project. He was part of the group who, prior to the first atomic tests, correctly theorized that a thermonuclear reaction would not ignite the earth's atmosphere.
[4 offprints] [S13297]

SOLD

1. **KONOPINSKI, Emil J.** *Beta-Decay.* Offprint from: *Reviews of Modern Physics,* Vol. 15, No. 4, pp. 209-245, October, 1943. Signed by Pais. Original orange printed wrappers.

2. **KONOPINSKI, Emil J.** *H³ and the Mass of the Neutrino.* Offprint from: *The Physical Review,* Vol. 72, No. 6, pp. 518-519, September 15, 1947.

3. **KONOPINSKI, E. J.; MAHMOUD, H. M.** *The Evidence of the Once-Forbidden Spectra for the Law of ß-Decay.* Offprint from: *The Physical Review,* Vol. 88, No. 6, pp. 1266-75, December 15, 1952. Signed by Pais.

4. **KONOPINSKI, E. J.; MAHMOUD, H. M.** *The Universal Fermi Interaction.* Offprint from: *The Physical Review,* Vol. 92, No. 4, pp. 1045-1049, November 15, 1953. Signed by Pais. "On the basis of the hypothesis that the same form of interaction acts among any spin 1/2 particles, it is interesting to apply the interaction law found for beta decay to the muon processes. The application is beset by two types of ambiguity. The first is due to the uncertainty in measured values of coupling constants, and particularly their signs. The second arises from the various ways in which the correspondence between the particles of muon and beta decay may be taken. Arguments are presented that the unique correspondence established if two like neutrinos are ejected in muon decay is the correct one. It is argued that previous interpretations of the Universal Fermi Interaction have been unjustifiably broad. Only processes in which two normal particles (vs antiparticles) are annihilated, and two created, should be expected. The positive muon must be treated as the normal particle (if the neutron, proton and negatron are) in order to avoid the expectation that muon capture by a proton may yield electrons, contrary to experimental facts. The conclusion that two like neutrinos are ejected in muon decay follows immediately." – abstract.

Ralph Kronig

KRONIG, Ralph de Laer (1904-1995). German-American physicist known for his theory of x-ray absorption spectroscopy and the discovery of particle spin. Other contributions to science include the Kronig-Penney Model and Coster-Kronig transition. Here are his three papers on the neutrino theory of light. He was awarded the Max Planck Medal in 1962. [S13298]

[4 offprints] SOLD

1. **KRONIG, R. De L**. *Zur Neutrinotheorie des Lichtes. Offprint from: Sonderuck aus Physica, II. 5, S. pp. 491-498. Haag: Martinus Nijhoff, 1935.* Original grey printed wrappers.

2. **KRONIG, R. De L**. *Zur Neutrinotheorie Des Lichtes II.* Offprint from: *Sonderuck aus Physica,* II, 8, S. pp. 854-860. Haag: Martinus Nijhoff, 1935. Original grey printed wrappers.

3. **KRONIG, R. De L**. *Zur Neutrinotheorie Des Lichtes III.* Offprint from: *Sonderuck aus Physica,* II, 9, S. pp 968-980. Haag: Martinus Nijhoff, 1935. Original grey printed wrappers.

4. **KRONIG, R. De L.; JORDAN, Pascual** (1902-1980)**.** *Lichtquant und Neutrino. II. Dreidimensionales Strahlungsfeld.* Offprint from: *Zeitschrift Für Physik*, Sonderabdruck 100. band. 9. und 10. heft. pp. 569-583. 1936. ["Together with Max Born and Werner Heisenberg, Jordan was a coauthor of an important series of papers on quantum mechanics. He went on to pioneer early quantum field theory before largely switching his focus to cosmology before World War II." – Wikip.].

Thomas Kuhn

KUHN, Thomas Samuel: (1922-1996). American physicist. He obtained his Bachelor's degree in physics from Harvard University in 1943 and his Masters in 1946 following with a PhD in 1949. He's best known for his book *The Structure of Scientific Revolutions*, which introduced the concept of a "paradigm shift". [S13299]

KUHN, Thomas S.; HEILBRON, John L. *The Genesis of the Bohr Atom.* Offprint from: *The Historical Studies in the Physical Sciences,* Volume 1, pp. 211-290, 1969. Original yellow printed wrappers.   [1 offprint] $ 30

KUIPER, Nicolaas Hendrik: (1920-1994). Dutch mathematician known for proving Kuiper's test and proving Kuiper's theorem. [S13300]

KUIPER, N. H. *Symmetire en Waarschijnlijkheid.* Offprint from: *Hogeschool Op Maandag,* 30 October, pp. 1-12, 1950. Original blue printed wrappers. $ 25

KUMMER, Wolfgang (1935-2007). Wolfgang Kummer was an Austrian theoretical physicist and former CERN council president. He was the first director of the Institute for High Energy Physics at the Austrian Academy of Sciences, which he led from 1966 to 1971. [S13301]

[1 offprint] $ 35

KUMMER, Wolfgang. *On the Iteration Procedure in the Peratization of Weak Leptonic Interactions.* Offprint from: CERN, Il Nuovo Cimento, Serie X, Vol. 32, pp. 1653-1664. 16 Giugno 1964. "The field theory of weak interactions as formulated by Feinberg and Pais leads for the sum of uncrossed ladder graphs in weak leptonic scattering to the solution of two singular integral equations. A slight modification, which seems to be in the spirit of the whole approach, makes the full solution of one of them possible. In perturbation expansions in the coupling constantg2, the limiting process for the invariant cut-off is tested together with the Feinberg-Pais iteration procedure of solving the integral equation. Their result is reproduced up to second order in an unambiguous way." -abstract

KURTI, Nicholas (1908-1998). Kurti was a Hungarian-born physicist who lived in Oxford for most of his life. During WWII he participated in the Manhattan project, returning to Oxford at the end of the war. Kurti and his frequent collaborator Franz Simon performed an experiment which managed to achieve a temperature of one microkelvin. Kurti was subsequently elected a Fellow of the Royal Society. [S13302]

KURTI, N. *The Absolute Temperature Scale at Low Temperatures.* Zeitschrift für Physikalische Chemie Neue Folge, 16, 3-6, Simon-Gedenkheft, pp. 281-291, 1958.   [1 offprint] $ 50

KUSAKA, Shuichi (1915-1947). Kusaka was a Japanese-Canadian physicist who studied under Hideki Yukawa and J. Robert Oppenheimer. Despite drowning at age 32, Kusaka made significant contributions to the field of theoretical physics. [S13303]

[**KUSAKA, Shuichi** (1915-1947)]**.** Shuichi Kusaka. [4] pp. Proposal for establishing the "Shuichi Kusaka Memorial Fund". [ca. 1947?]. Signed by Abraham Pais. $ 25

LAMB, Willis Eugene (1913-2008). American physicist who won the Nobel Prize in Physics in 1955 for research related to his discovery of the Lamb Shift. [S13304]

KROLL, Norman Myles: (1922-2004). American theoretical physicist known for his pioneering research in Quantum Electrodynamics, at the Institute for Advanced Study, went on to become a professor of physics at Columbia and later head of the physics department at UCSD.
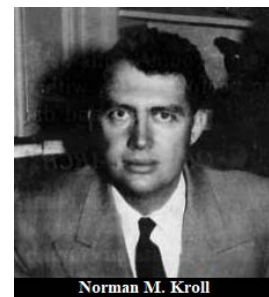
o **KROLL, Norman M.; LAMB, Willis E.** (1913-2008). *On the Self-Energy of a Bound Electron.* Offprint from: *The Physical Review,* Vol. 75, No. 3, pp. 388- 398, February 1, 1949. Includes Errata slip with 7 corrections. "[In 1948] Kroll and Lamb and, right thereafter, French and Weisskopf submitted their papers on the Lamb shift. Deftly these authors had managed to obtain correct answers by non-covariant methods... With the successful completion of the magnetic moment and Lamb shift calculations, a solid beachhead had been established in uncharted terrain, the physics of radiative corrections" - Pais, *Inward Bound*, pp.460-461. This paper represents a significant step in the research which would, 6 years later, result in Lamb winning the Nobel Prize in Physics. $ 450

MENON, Mambillikalathil Govind Kumar: (1928-2016). Indian physicist, known for his work with cosmic rays. During his career he was President of the Indian Statistical Institute and the National Academy of Sciences, India, and director of the Tata Institute of Fundamental Research, Mumbai. He was a Fellow of the Royal Society and a Fellow of the Indian Space Research Organization, and received the Shanti Swarup Bhatnagar prize for Science and Technology and the Abdus Salam Medal. [S13305]

$ 50

o **MENON, M. G. K.; FRIEDLANDER, M. W.; HARRIS, G. G.** *A search for Nuclear Disintegrations produced by slow Negative Heavy Mesons.* Offprint from: *the Proceedings of the Royal Society,* A, volume 221, pp. 394-405, 1954. Signed by Pais. [Abstract: This paper describes the preliminary results of a search for evidence of the nuclear interactions of negative heavy mesons. A qualitative analysis is given of the possible characteristics of their interactions and the appearance these might be expected to have in photographic emulsions. 37 ml. of emulsion, in which are recorded 10000 stars and 1200 slow π-mesons, have been completely examined. In the conditions of exposure, such a volume should contain six examples, with good geometry, of the decay of heavy mesons. Mass measurements have been carried out, by the range/scattering method, on 417 tracks of σ-mesons. In addition, 1800 σ-mesons, observed in 42 ml. of emulsion, have been examined. No disintegrations which can be attributed to heavy mesons have been

found. The results suggest that some of the negative heavy mesons, on being brought to rest in photographic emulsions, behave in a manner qualitatively different from that of negative π-particles. Possible explanations for this result are suggested.]
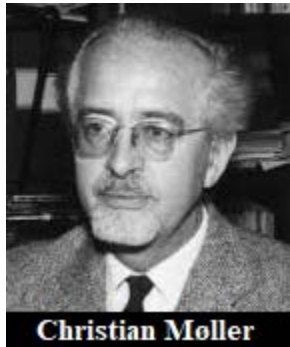
Christian Møller

MØLLER, Christian: (1904-1980), Danish physicist and chemist. Møller made fundamental contributions to the theory of gravitation, theory of relativity, and quantum chemistry. Coined the term "nucleon". [S13306]

[23 papers or offprints] $ 2,000

1. **MØLLER, Christian.** *Über den Stoß zweier Teilchen unter Berücksichtigung der Retardation der Kräfte.* From: *Zeitschrift Für Physik,* Sonderabdruck 70.Band. 11. und 12. Heft. Verlag von Julius Springer, Berlin, 1931.

2. **MØLLER, Christian.** *Zur Theorie des Durchgangs Schneller Elektronen Durch Materie.* København MCMXXXII, Forsvaret finder Sted Mandag d. 28. November 1932 Kl. 2 i Auditoriet paa Universitetets fysiologiske Institut, Henrik Harpestrengsvej 5. pp. XXV, 531-585. Original grey printed wrappers; cover and title page torn [3 inches]. Signed by Pais.

3. **MØLLER, Christian.** *Zur Theorie des Austauschproblems und des Ferromagnetismus bei tiefen Temperaturen.* From: *Zeitschrift Für Physik,* Sonderabdruck 82. Band. 9. und 10. Heft. Verlag von Julius Springer, Berlin, 1933.pp. 559-567. Creased.

4. **MØLLER, Christian.** *On the Radiative Collision Between Fast Charged Particles.* Offprint from: *Proceedings from the Royal Society of London,* Series A, No. 876, Vol. 152, pp. 481-496, November 1935. Original light brown printed wrappers; creased.

5. **MØLLER, Christian; Rosenfeld, L.** *Theory of Mesons and Nuclear Forces.* Offprint from: *Nature,* Vol. 143, p. 241, February 11, 1939. Offprint crinkled throughout, small tear on bottom of both leaves. "IN a recent note[1] on the static interaction between nuclear particles,

Dr. C. Møller and Prof. L. Rosenfeld describe the results of a canonical transformation which makes it possible to separate dynamic and static interactions, and they state: "The static interaction is in all cases exactly the same as that obtained as a first approximation in the perturbation method". They referred to certain work done previously[2] by me, and I wish to point out that the above statement does not correspond to my results. If this statement applies to the interaction between two Dirac electrons, this is only because in that case we have but *one component* of the field giving static effect, namely, the electrostatic potential. For nuclear interactions, the field must have at least *two components*(usually expressed as one complex field: the meson field). If one tries as before to separate each component into the static solution of the wave equation and the transformed field component, one finds that this transformation is no longer canonical. This is due to the fact that these static parts do not commute because they are formed with the aid of the non-commuting 'isotopic spin matrices' of the heavy particles." – abstract.

6. **MØLLER, Christian; Rosenfeld, L.** *On the Field Theory of Nuclear Forces.* Det Kgl. Danske Videnskabernes Selskab. Mathematisk-fysiske Meddelelser. XVII, 8, pp. 1-72, København 1940. Original red printed wrappers; broken at spine hinge. Previous hinge repair present.

7. **MØLLER, Christian.** *On the Theory of Mesons.* Det Kgl. Danske Videnskabernes Selskab. Mathematisk-fysiske Meddelelser. XVIII, 6. København, Ejnar Munksgaard, 1941. 46. pp. Original red printed wrappers; top right front cover corner clipped [expunging Pais' ownership-name from the document] due to World War II – because of the war Pais hid his signed name from the Nazis such that when he was studying in The Netherlands and hoped to remain undetected from their purview. Signed by Pais.

8. **MØLLER, Christian.** *General Properties of the Characteristic Matrix in the Theory of Elementary Particles II.* Det Kgl. Danske Videnskabernes Selskab Mathematisk-Fysiske Meddelelser, Bind XXII, Na. 19. København, I Kommission Hos Ejnar Munksgaard, 1946. pp. 1-46. Signed by Pais. Original tan printed wrappers.

9. **MØLLER, Christian.** *Grundtraek af den moderne Atomfysik.* [Including 4 sections]: *1. Molekyler Atomer Elektroner. Atomkerner; 2. Ioner. det Periodiske System. Isotoper. Nukleoner; 3. Grundstofforvandling. Atomenergien; 4. Fission. Atombomben.* Grundrids ved folkelig Universitetsundervisning. Nr. 455. Udgivet af Folkeuniversitetsudvalget. I Kommission hos Ejnar Munksgaards Forlag. København 1946. Bogladepris 20 Øre. pp. 1-16. Original orange printed wrappers.

10. **MØLLER, Christian.** *New Development in Relativistic Quantum Theory.* Offprint from: *Nature,* Vol. 158, p. 403, September 21, 1946. Pagination: 1-7. "THE ordinary quantum mechanics which, in principle, was completed in the middle of the 'twenties, gives a correct account of a very large number of experimental results. Still, it was from the beginning quite clear that this theory is an approximation to the truth, since it does not satisfy the requirements of the theory of relativity. Non-relativistic quantum mechanics would, therefore, be expected to give correct results only in those cases where the velocities of the elementary particles are small compared with the velocity of light." – abstract.

11. **MØLLER, Christian.** *Recent Developments In Relativistic Quantum Theory.* Institut f.teoretisk Fysik, Copenhagen. Lectures delivered at the H. H. Wills Physical Laboratory, University of Bristol, Spring Term, pp. 1-39, 1946. Lecture notes by I. N. Sneddon. Signed by Pais.

12. **MØLLER, Christian.** *Hideki Yukawa. Nobelpristager i fysik for året 1949.* Offprint from: *Særtryk af Fysisk Tidsskrift,* nr. 3 – 4, pp. 68-70, 1950. Signed by Pais.

13. **MØLLER, Christian; Kristensen, P.** *On a Convergent meson Theory. I.* Det Kongelige Danske Videnskabernes Selskab. Matematisk-fysiske Meddelelser, bind 27, nr. 7, pp 1-51, 1952. Original brown printed wrappers. Signed by Pais.

14. **MØLLER, Christian.** *On the Problem of Convergence in Non-Local Field Theories.* Offprint from: *Proceedings of the International Conference of Theoretical Physics Kyoto and Tokyo,* September 1953. Held under the auspices of the IUPAP with a subvention from UNESCO. pp. 13-23. Signed by Pais. Original printed wrappers.

15.   **MØLLER, Christian.** *The Ideal Standard Clocks in the General Theory of Relativity.* Offprint from: *Helv. Phys. Acta,* Suppl. IV, p. 54, Birkhäuser Verlag, Basel 1956. Signed by Pais.

16.   **MØLLER, Christian.** *The Concept of Mass and Energy in the General Theory of Relativity I & II.* Det Kongelige Norske Videnskabers Selskabs Forhandlinger; Bind 31, 1958, Nr. 13, og 14. pp. 1-5; Bind 31, 1958, Nr. 14. pp. 1-7. Original orange printed wrappers.

17.   **MØLLER, Christian.** *On the Localization of the Energy of a Physical System in the General Theory of Relativity.* Offprint from: *Annals of Physics,* Vol. 4, No. 4, pp. 347-371, August, 1958.

18.   **MØLLER, Christian.** *The Energy-Momentum Complex in the General Theory of Relativity.* Offprint from; *Matematisk-fysiske Meddelelser,* Dan. Vid. Selsk, Bind 31, nr. 14, pp. 1-39. København 1959. Original grey printed wrappers. Note: tipped in index style card.

19.   **MØLLER, Christian.** *Über Die Energie Nichtabgeschlossener Systeme in Der Allgemeinen Relativitätstheorie.* pp.139-153. 1959. Stamped C. MØLLER.

20.   **MØLLER, Christian.** *Further Remarks on the Localization of the Energy in the General Theory of Relativity.* Offprint from: *Annals of Physics, Volume 12, No. 1, pp. 118-113, January 1961.*

21.   **MØLLER, Christian.** *Conservation Laws and Absolute Parallelism in General Relativity.* Offprint from: *matematisk-fysiske Skrifter.* Det Kongelige Danske Videnskabernes Selskab, Bind 1, Nr. 10, pp. 1-50, 1961. Original brown printed wrappers.

22.   **MØLLER, Christian.** *New experimental tests of the special principle of relativity.* Offprint from: *Proceedings of the Royal Society,* A, volume 270, pp. 306-314, pp. 306-314, 1962.

23.   **MØLLER, Christian.** *Gravitational Energy Radiation.* Offprint from: *Physics Letters,* Volume 3, number 7, pp. 329-331, 15 February 1963.

MONTROLL, Elliott Waters: (1916-1983), American mathematician and scientist. Montroll taught at a variety of different institutions throughout his career, including Yale, Cornell, and Princeton. In 1943 he was appointed Head of the Mathematics Research Group at the Kellex Corporation, where he worked on programs related to the Manhattan Project. Eventually he accepted a professorship at the University of Maryland. He did significant work on traffic flow and continuous-time random walk, and received the Lanchester Prize in 1959. [S13307]

[2 offprints] $ 50

1. **MONTROLL, Elliott W.** *On the entropy function in sociotechnical systems. (Sears Roebuck catalogues/stimulus-response/traffic flow/fluctuations).* From: *Proc. Natl. Acad. Sci. USA,* vol. 78, No. 12, pp. 7839-43, Economical Sciences, December 1981. "The entropy function H = -Sigmap(j) log p(j) (p(j) being the probability of a system being in state j) and its continuum analogue H = integralp(x) log p(x) dx are fundamental in Shannon's theory of information transfer in communication systems. It is here shown that the discrete form of H also appears naturally in single-lane traffic flow theory. In merchandising, goods flow from a whole-saler through a retailer to a customer. Certain features of the process may be deduced from price distribution functions derived from Sears Roebuck and Company catalogues. It is found that the dispersion in logarithm of catalogue prices of a given year has remained about constant, independently of the year, for over 75 years. From this it may be inferred that the continuum entropy function for the variable logarithm of price had inadvertently, through Sears Roebuck policies, been maximized for that firm subject to the observed dispersion." – Abstract.

2. **MONTROLL, Elliott W.; Shlesinger, Michael F.** *On 1/f noise and other distributions with long tails. (log-normal distribution/Lévy distribution/Pareto distribution/Scale-invariant process).* From: *Proc. Natl. Acad. Sci. USA,* Vol. 79, pp. 3380-3383, May 1982, Applied Mathematical Sciences. Original white Proc. natl. Acad. Sci. USA printed cover.
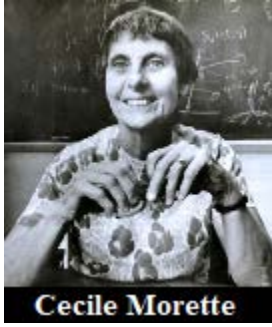
MORETTE, Cécile Andrée Paule Dewitt- (1922-2017), French mathematician and physicist. She founded a summer school at Les Houches which would eventually count as pupils over 20 Nobel Prize winners. In 2007 she received the American Society of the French Legion of Honour Medal for Distinguished Achievement. [S13308]

▪ **MORETTE, Cécile; Peng, H. W.** *On the Production of Mesons by Nucleon-Nucleon Collisions.* Offprint from: *Proceedings of the Royal Irish Academy,* Vol. II, Section A, No. 17, pp. 217-237, February, 1948. 51 A 17. Spine torn. $ 45

MORSE, Philip McCord: (1903-1985), American physicist and the originator of operations research in World War II. Served as president of the American Physical Society and the Acoustical Society of America, co-founder of the MIT Acoustics Laboratory, and first director of the Brookhaven National Laboratory. [S13309]

[3 offprints] $ 100

1. **MORSE, Philip M.** *Acoustics and Basic Physics.* Offprint from: *The Journal of the Acoustical Society of America,* Vol. 27, No. 2, pp. 213-216, March, 1955. Worn.

2. **MORSE, Philip M.** *Stochastic Properties of Waiting Lines.* Offprint from: *The Journal of Operations Research Society of America,* Vol. 3, No. 3, pp. 255-261, August, 1955. "The stochastic properties of waiting lines may be analyzed by a two-stage process: first solving the time-dependent equations for the state probabilities and then utilising these transient solutions to obtain the auto-correlation function for queue length and the root-mean-square frequency spectrum of its fluctuations from mean length. The procedure is worked out in detail for the one-channel, exponential service facility with Poisson arrivals, and the basic solutions for the m-channel exponential service case are given. The analysis indicates that the transient behavior of the queue length n(t) may be

measured by a "relaxation time," the mean time any deviation of n(t) away from its mean value L takes to return (1/e) of the way back to L. This relaxation time increases as $(1 - \rho)^{-2}$ as the utilization factor ρ approaches unity, whereas the mean length L increases as $(1 - \rho)^{-1}$. In other words, as saturation of the facility is approached, the mean length of line increases; but, what is often more detrimental, the length of time for the line to return to average, once it diverges from average, increases even more markedly." – abstract.

3. **MORSE, Philip M.** *Where Is The New Blood?* Offprint from: *The Journal of the Operations Research Society of America,* Vol. 3, No. 4, pp. 383-387, November, 1955. Signed by Pais.

MORSE, Marston: (1892-1977). American mathematician, known for introducing differential topology to the calculus of variations, now known as Morse theory. He received the Bôcher Memorial Prize in 1933 and the National Medal of Science in 1964. [S13310]

Marston Morse

✓ **MORSE, Marston.** *What Is Analysis In The Large?* Offprint from: *The American Mathematical Monthly,* Vol. XLIX, No. 6, pp. 358-364, June-July, 1942. Signed by Pais. $ 35

MOSHINSKY BORODIANSKY, Marcos (1921-2009). Mexican Physicist of Ukrainian-Jewish origin. His discoveries in the field of particle physics won him the Prince of Asturias Prize in 1988 and the UNESCO Science Prize in 1997. [S13311]

Marcos Moshinsky

[8 offprints, 1 copy] $ 125

1. **MOSHINSKY BORODIANSKY, Marcos** (1921-2009)**.** *Forces Tensorielles Dépendant de la Vitesse.* Offprint from: *Le Journal de Physique et le Radium,* Tome 13, Novembre 1954, page 264. Signed by Pais. Moshinsky

was a Mexican physicist of Ukrainian-Jewish origin whose work in the field of elementary particles won him the Prince of Asturias Prize for Scientific and Technical Investigation in 1988 and the UNESCO Science Prize in 1997.

2. **MOSHINSKY Borodiansky, Marcos.** *Diffraction in Time.* Offprint from: *The Physical Review,* Vol. 88, No. 3, pp. 625-631, November 1, 1952. Original turquoise printed wrappers. Signed by Pais. "In a previous note a dynamical description of resonance scattering was given, and transient terms appeared in the wave function describing the process. To understand the physical significance of these terms, the transient effects that appear when a shutter is opened are discussed in this paper. For a nonrelativistic beam of particles, the transient current has a close mathematical resemblance with the intensity of light in the Fresnel diffraction by a straight edge. This is the reason for calling the transient phenomena by the name of diffraction in time. The shutter problem is discussed for particles whose wave functions satisfy the Schrödinger equation, the ordinary wave equation, and the Klein-Gordon equation. Only for the Schrödinger time-dependent equation do the transient wave functions resemble the solutions that appear in Sommerfeld's theory of diffraction. The connection of transient phenomena with the time-energy uncertainty relation, and the interpretation of the transient current in a scattering process, are briefly discussed. The relativistic wave functions for the shutter problem may play an important role in the dynamical description of a relativistic scattering process." – abstract.

3. **MOSHINSKY Borodiansky, Marcos.** *Poles of the S Matrix for Resonance Reactions.* Offprint from: *The Physical Review,* Vol. 91, No. 4, pp. 984-985, August 15, 1953. Signed by Pais.

4. **MOSHINSKY Borodiansky, Marcos.** *Transformation Brackets for Harmonic Oscillator Functions.* From: *Nuclear Physics* 13 (1959) 104-116; North Holland Publishing Co., Amsterdam. "We define the transformation brackets connecting the wave functions for two particles in an harmonic oscillator common potential with the wave functions given in terms of the relative and centre of mass coordinates of the two particles. With the help of these brackets we show that all matrix elements for the interaction potentials in nuclear shell theory can be given directly in terms of Talmi integrals. We obtain recurrence relations and explicit algebraic expressions for the transformation brackets that will permit their numerical evaluation" – abstract.

5. **MOSHINSKY Borodiansky, Marcos; BARGMANN, V..** *Group Theory of Harmonic Oscillators. (I). The Collective Modes.* From: *Nuclear physics 18* (1960) 697-712; North-Holland Publishing Co., Amsterdam. "The present series of papers will deal with the classification of states of N particles moving in a harmonic oscillator common potential. In this paper we will be mainly concerned with the classification scheme that brings out a collective nature of the states. To obtain this collective behaviour, we take advantage of the invariance of the hamiltonian under both ordinary rotations and the unitary group in N dimensions." – abstract.

6. **MOSHINSKY Borodiansky, Marcos; BARGMANN, V.** *Group Theory of Harmonic Oscillators. (II). The Integrals of Motion for the Quadrupole-Quadrupole Interaction.* From: *Nuclear Physics 23* (1961) 177-199; North-Holland Publishing Co., Amsterdam. pp. 196-199 separated from staple. [reproduced copy].

7. **MOSHINSKY Borodiansky, Marcos.** *Wigner Coefficients for the SU_3 Group and some Applications.* Offprint from: *Reviews of Modern Physics,* Vol. 34, No. 4, pp. 813-828, October 1962.

8. **MOSHINSKY Borodiansky, Marcos.** *Gelfand States and the Irreducible Representations of the Symmetric Group.* Offprint from: *Journal of Mathematical Physics,* Volume 7, Number 4, pp. 691-698, April 1966. "The set of Gelfand states corresponding to a given partition [h1 ... hn] form a basis for an irreducible representation of the unitary group Un. The special Gelfand states are defined as those for which [h1 ... hn] is a partition of n and the weight is restricted to (11 ... 1). We show that the special Gelfand states constitute basis for the irreducible representations of the symmetric group Sn and use this property to construct explicitly states in configuration and spin- isospin space with definite permutational symmetry." – abstract.

9. **MOSHINSKY Borodiansky, Marcos; Syamala Devi, V.** *General Approach to Fractional Parentage Coefficients.* Offprint from: *Journal of Mathematical Physics,* Volume 10, Number 3, pp. 455-466, March 1969. Abstract: The purpose of this paper is to achieve a clearer understanding of the problems involved in the determination of a closed formula for fractional parentage coefficients (fpc). The connection between the fpc and one- block Wigner coefficients of a unitary group of dimension equal to that of the number of states is explicitly derived. Furthermore, these

Wigner coefficients are decomposed into ones characterized by a canonical chain of subgroups (for which an explicit formula is given) and transformation brackets from the canonical to the physical chain. It is in the explicit and systematic determination of the states in the latter chain where the main difficulty appears. We fully analyze the case of the p shell to show that a complete nonorthonormal set of states in the physical chain [upsilon] $\mathcal{U}(3) \supset R(3)$ can be derived easily using Littlewood's procedure for the reduction of irreducible representations (IR) of SU(3) with respect to the subgroup R(3). This procedure gives a deeper understanding of the free exponent appearing in the polynomials in the creation operators defining the states in the [upsilon] $(3) \supset R(3)$ chain. As Littlewood's procedure applies to the [upsilon] $(n) \supset R(n)$ chain, and probably can be generalized to other noncanonical chains of groups, it opens the possibility of obtaining general closed formulas for the fpc in a nonorthonormal basis.

MÜLLER, Volkhard F.; ROTHLEITNER, J. *The Adler-Weisberger Sum Rule.* Zeitschrift für Physik, 202, 349-363, 1967. [Abstract: Starting from a weak form of the axial current algebra and usingFubini's covariant dispersion method we give a fairly rigorous derivation of the Adler-Weisberger sum rule. Special attention is given to the necessary continuation in the "pion mass". Combining the sum rule with the forwardπ±p dispersion relation we obtain a sum rule containing essentially low energy data. A numerical evaluation is given for two sets of existing s-waveπN scattering lengths. The one reproducesAdler's andWeisberger's results, the other improves the agreement with experiment giving rA=1.20.] [S13312] $ 45

MULVEY, John H. *A Study of a Disintegration produced by a particle of energy ~20,000 GeV.* Offprint from: *the Proceedings of the Royal Society,* A, volume 221, 1954, pp. 367-383. Signed by Pais. Mulvey was with the H.H. Wills Physical Laboratory, University of Bristol, and the Nuclear Physics Laboratory at the University of Oxford, & CERN. [Abstract: A detailed investigation has been made of a nuclear disintegration produced by a charged particle, almost certainly a proton, of energy ~20 000 GeV. The disintegration, of type 22 + 76p, was recorded in a stack of plates exposed at ~90 000 ft. The jet of secondary charged particles, and the associated cascade of electrons and photons, can be followed through the emulsion of twenty-two plates. The observations lead to a value 0·25 for the ratio of neutral π-particles to charged shower particles produced in the disintegration. If π0-mesons are produced in high-energy

nuclear interactions with a frequency half that of the charged π-mesons, and if 10% of the shower particles are assumed to be protons, the present results indicate that 40 % of the charged shower particles are other than π-mesons. As there is no evidence for the existence of nucleon pairs, it is reasonable to identify these other particles with the heavy k-particles. The corresponding ratio of the numbers of charged k- to π-mesons, $NK\pm/N\pi\pm$, is equal to 0·80±0·4. The interaction length of the shower particles from the event, measured without distinction between the different types of mesons which may be among them, is shown to be very nearly equal to the value for nucleons. It follows that the k-mesons, which constitute a large fraction of the shower particles, interact strongly with nuclei.] [S13313] $ 45

MURAI, Yasuhisa. *Discrimination Between Strong and Weak Interactions.* Offprint from: *Nuclear Physics,* Vol. 17, No. 4, pp. 529-547, 1960. Original light blue printed wrappers. Signed by Pais. [Abstract: A discrimination between strong and weak interactions will be made on the basis of a five-dimensional theory in which fermions are represented by eight-component spinors. The operators representing hyperonic charge and chirality are formed and it will be shown how strangeness, as derived from them, can give a measure of the strength of the interaction. The type of coupling is determined too, though this depends on the assignment of new characteristics to the particles.] [S13314]

MURAI, Yasuhisa. *Theory of Field in a Five-Dimensional Space.* Offprint from: *The Science Reports of the Saitama University.* Series A. Vol. III, No. 3, pp. 156-65, September 1960. Signed by Pais.   [2 offprints] $ 100

Ivan Muzinich

MUZINICH, Ivan J. Received his PhD from UC Berkeley in physics in 1962, worked at Brookhaven National Laboratory from 1968-1987. He also worked at Honeywell Corporation (1999-2001), Kavli Institute for Theoretical Physics (1985-88). At present he is affiliated with IJM Consulting [his initials]. [S13315]

1. **MUZINICH, Ivan J.; HUANG, Kerson.** *Nucleon-Nucleon and Nucleon-Antinucleon Charge-Exchange Scattering and Conspiracy of Singularities in the Complex Angular Momentum Plane.* Offprint from: *The Physical Review,* Vol. 164, No. 5, 1726-1735, 25 December 1967.

2. **MUZINICH, Ivan J.; ABERS, Ernest S.; CASSANDRO, Marzio; TEPLITZ, Vigdor L.** *Conspiracy or Evasion; the Electron's Way.* Offprint from: *The Physical Review,* Vol. 170, No. 5, 1331-1343, 25 June 1968. Muzinich was at Rockefeller University and knew Pais. Signed by Pais.
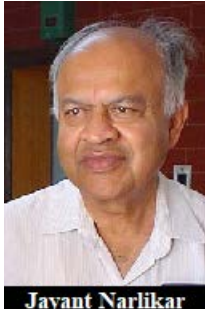
[2 offprints] $ 45

NAMBU, Yoichiro (1921-2015). A Japanese-American physicist, known for his contributions to the field of theoretical physics. He shared the Nobel Prize in Physics in 2008 for the discovery of the mechanism of spontaneous broken symmetry in subatomic physics. He also received a number of other prizes in physics. He spent most of his career at the University of Chicago. "Nambu was one of the great theoretical physicists of the latter half of the 20th century. Much of the current theory of elementary particles revolves around seminal contributions by Nambu," said Peter Freund, professor emeritus in physics at University of Chicago. [S13316]

[3 offprints] $ 750

☐ **NAMBU, Yoichiro.** *An Empirical Mass Spectrum of Elementary Particles.* From: *Progress of Theoretical Physics,* Vol. 7, No. 6, pp. 595-6, June 1952. 2 inch tear on left side. Signed by Pais.

☐ **NAMBU, Yoichiro.** *General Discussion. Introductory Talk.* From: *Proceedings of the International Conference on Elementary Particles 1965 Kyoto.* pp. 327-340. Pencil annotation on p. 327. Original printed wrappers. Signed by Pais.

☐ **NAMBU, Yoichiro.** *A Systematics of Hadrons in Subnuclear Physics.* Offprint from: *Preludes in Theoretical Physics,* The Enrico Fermi Institute for Nuclear Studies and the Department of Physics, The University of Chicago, Chicago, Illinois. 1966. pp. 133-142. Original gray printed wrappers.

Jayant Narlikar

NARLIKAR, Jayant Vishnu (b. 1938). Indian astrophysicist, known for his work on conformal gravity theory with Fred Hoyle. He has received the Adams Prize, Padma Vibhushan, and Prix Jules Janssen. [S13317]

[2 offprints] $ 75

➢ **NARLIKAR, J. V.; RANA, N. C.** *Newtonian N-body calculations of the advance of Mercury's perihelion.* From: *Mon. Not. R. astr. Soc. (1985) 213, 657-663.* Inscribed to Abraham Pais from Narlikar.

➢ **NARLIKAR, Jayant V**. (1938-). *Some Conceptual Problems in General Relativity and Cosmology.* Offprint from: A Random Walk in Relativity and Cosmology, eds. N.K. Dadhich, J. Krishna Roa, J.V. Narlikar, C.V. Vishveshwara. Wiley Eastern, 1985. INSCRIBED by the author to Abraham Pais. Note: Jayant Vishnu Narlikar is an Indian astrophysicist. He developed with Sir Fred Hoyle the conformal gravity theory, known as Hoyle–Narlikar theory. It synthesizes Albert Einstein's Theory of Relativity and Mach's Principle. Narlikar is known for his work in cosmology, especially in championing models alternative to the popular Big Bang model. See: Monte, Leslie, "I don't subscribe to the bandwagon idea of Big Bang: Jayant Vishnu Narlikar." Live Mint, 24 Jan. 2015.
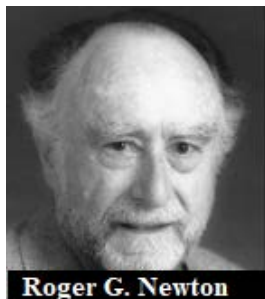

Henry V. Neher

NEHER, Henry Victor (1904-1999). Caltech professor of physics, one of the university's first physics PhDs who worked in Robert Millikan's cosmic-ray research group for 20 years and served on Caltech's faculty for 40 years. [S13318]

[1 offprint] $ 25

o **NEHER, H. V.** *The Primary Cosmic Radiation.* Offprint from: *Annual Review of Nuclear Science,* Vol. 8, pp. 217-242, 1958.

Roger G. Newton

NEWTON, Roger Gerhard. (b. 1924). Worked at the Institute for Advanced Study at Princeton before taking a position at Indiana University, where he stayed for the next 50 years. Author of a number of books, including *From Clockwork to Crapshoot: A History of Physics.* [S13319]

[1 offprint] $ 20

✓ **NEWTON, Roger G.; FONDA, Luciano.** *Threshold Behavior of Cross Sections of Charged Particles.* Offprint from: *Annals of Physics,* Volume 7, No. 2, 133-145, June 1959." The energy dependence of scattering and reaction cross sections at the threshold of a new channel with Coulomb forces is investigated. In the case of opposite charges an anomaly is found in which the average over the Coulomb bound state resonances below the threshold energy is discontinuously different from the limit from above. The resolution and precision necessary, however, make it very difficult to measure the phenomenon." – abstract.

NICHOLS, Rodney W. President and CEO of the New York Academy of Sciences and Vice President of Rockefeller University. [S13320]

NICHOLS, Rodney W. *Some Practical Problems of Scientist-Advisers.* Offprint from*: Minerva,* Vol. X, No. 4,603-613, October 1972. $ 25

NILSSON, S. Bertil: Affiliated with the Institute of Mechanics and Mathematical Physics, University of Lund, Sweden. [S13321]

1. **NILSSON, S. Bertil.** *On the Electrostatic Self-Energy of the Electron in the Hole Theory.* From: *Kungl. Fysiografiska Sällskapets I Lund Förhandlingar,* Bd. 16, No. 24., June 1, 1946. Original mint green printed wrappers. INSCRIBED TO ABRAHAM PAIS FROM THE AUTHOR.

2. **NILSSON, S. Bertil.** *On the Calculation of Self-Energies in Quantum Theory by Analytic Continuation.* Offprint from: *The Physical Review,* Vol. 73, No. 8, pp. 903-909, April 15, 1948. Original light green printed wrappers. INSCRIBED TO ABRAHAM PAIS BY AUTHOR. "Riesz's method of solving hyperbolic differential equations by analytic continuation has been used by Gustafson to eliminate infinities in quantum theory. Treating the one-electron case, he found finite values of the self-energy integrals in the second approximation, also for those integrals for which the λ-limiting process fails (without the further assumption of negative-energy photons). In the present paper it is shown that the general result of Gustafson's procedure is to remove all divergences normally appearing in self-energy expressions, except logarithmic divergences. Thus the total self-energy of the electron, to the second approximation, is found to be zero on the one-electron theory if calculated by this method, whereas in the hole theory the logarithmically divergent expression of Weisskopf is retained. A proposal by Pauli to alter the commutation rules in a certain way gives essentially the same results." –abstract.

3. **NILSSON, S. Bertil.** *The e^4 Approximation of the Self-Energy of the Electron treated by Analytic Continuation.* Arkiv För Matematik, Astronomi Och Fysik. K. Svenska Vetenskapsakademien, Band 36, A, No. 5, pp. 1-13, 1948. Original tan printed wrappers. INSCRIBED TO ABRAHAM PAIS BY AUTHOR.

4. **NILSSON, S. Bertil.** *Interaction of Electrons and an electromagnetic field treated by analytic continuation.* Arkiv För Fysik, Band 1, No. 19, pp. 369-423, 1949. Original beige printed wrappers.   [4 offprints] $ 175

Barry W. Ninham

NINHAM, Barry William (b. 1936). Australian physicist, Fellow of the Australian Academy of Science, Officer of the Order of Australia, recipient of the Matthew Flinders Medal. He founded Australian National University's department of applied mathematics in 1970. [S13322]

1. **NINHAM, Barry W.** *Asymptotic Form of the Coefficients of Some Ising-Model Series.* Offprint from: *Journal of mathematical Physics,* Volume 4, Number 5, pp. 679-685, May 1963. [Abstract: The exact asymptotic form of the coefficients of some two- dimensional Ising- model series is derived. A preliminary comparison with some three- dimensional series suggests that the asymptotic nature of their coefficients is not inconsistent with the same analytic behavior.]

2. **NINHAM, Barry W.** *Charged Bose Gas.* From: *Nuclear Physics 53* (1964) 685-692; North-Holland Publishing Co., Amsterdam. [Abstract: The ground state energy and specific heat of a high density charged Bose gas are computed via the method of Montroll and Ward. The result for the energy is in agreement with a calculation of Foldy.]   [2 offprints] $ 50

Nordsieck, Arnold Theodore (1911-1971). American theoretical physicist, student of Robert Oppenheimer, best known for his work with Felix Block on QED. [S13323]

Nordsieck, A. *The Low Frequency Radiation of a Scattered Electron.* Offprint from: *Physical Review*, Volume 52, July 15, 1937. Small blue ink spill shown throughout offprint. "The radiative scattering of a nonrelativistic electron is treated by an approximate method which neglects the reaction of the radiation field on the motion of the electron. In this approximation the different modes of oscillation of the radiation field are independent of one another, and can therefore be treated individually. For frequencies of the radiation small compared to the inverse impact time of the electron, it is shown that the probability of emitting any finite number of quanta is zero, and that the mean radiated energy depends only on the total change in velocity of the electron, the amount of energy radiated being given by the same formula as in classical theory." – abstract.

Ib Norlund

NØRLUND, Jørgen Ib: (1917-1989). Danish communist politician, nephew of Niels Bohr. After a brief career in physics, Nørlund spent the rest of his life in politics, generally taking a pro-Soviet stance. [S13324]

❖ **NØRLUND, Ib.** *Undor Representation of the Five-Dimensional Meson Theory.* Det Kgl. Danske Videnskabernes Selskab. Mathematisk-fysiske Meddelelser. XIX, 9, pp. 1-29. København 1942. Original red printed wrappers. Signed by Pais. $ 95

H. Pierre Noyes

NOYES, Henry Pierre: (1923-2016). American theoretical physicist, member of the SLAC National Accelerator Laboratory at Stanford. Son of renowned chemist William A. Noyes. He is associated with the Lawrence Livermore Lab. [S13325]

✚ **NOYES, Pierre H.** *Nuclear Forces.* Offprint from: *Proceedings of the Rutherford Jubilee International Conference,* Heywood & Co. Ltd., pp. 65-76, 1962. $ 45

Reinhard Oehme

OEHME, Reinhard (1928-2010). German-American physicist and student of Werner Heisenberg known for discoveries in a number of different fields. Oehme was a Guggenheim Fellow and American Physical Society Fellow, and recipient of the Humboldt Prize. [S13326]

[3 offprints/papers] $ 125

1.   **OEHME, Reinhard.** *Regge Poles in relativistic Schrödinger Theory.* Il Nuovo Cimento, Serie X, Vol. 25, pag. 183-192, 1° Luglio 1962. "The Regge trajectories α(E) associated with the scattering of relativistic particles at a Coulomb potential are considered as analytic functions of the energyE. The trajectories for particle and antiparticle scattering

are related by a simple crossing relation. In addition to the branch points at E=±m, the functions α(E) have complex branch points which are related to the possibility of a collapse into the centre. Corresponding singularities are expected for a Yukawa potential resulting from a vector meson interaction. The possible relevance of these results for relativistic dispersion theory is discussed." – abstract.

2. **OEHME, Reinhard.** *Complex Angular Momentum in Elementary particle Scattering.* Offprint from: *Strong Interactions and High Energy Physics*, pp. 129-222, 1964. Original light green cover. Note: Errata leaf relating to p. 211 – laid in. Signed by Abraham Pais.

3. **OEHME, Reinhard**. *Superconvergent Dispersion Relations*. Offprint from: Annals of Physics, Vol. 46, No. 2, pp. 347-363, February 1968.

Ogievetsky

Professor V.I. Ogievetsky, was a leading Russian theorist who made many significant contributions to theoretical elementary particle physics. "He was born in Dnepropetrovsk on August 6, 1928 into the family of I.E. Ogievetsky, Professor of Mathematics, and started his scientific activity as a theoretician in 1950 when he became a school-teacher in Dnepropetrovsk upon graduating from Dnepropetrovsk State University. His first studies were on the problem of the penetration of gamma-rays through matter. He received his PhD degree in Physics and Mathematics at the Lebedev Physical Institute in 1954. On the recommendation of Academician I.E. Tamm, in 1955 he was admitted to the V.I. Veksler laboratory at Dubna in the group of M.A. Markov where he actively began research on elementary particle physics and quantum field theory. He moved to the Joint Institute for Nuclear Research at Dubna in 1956 at the time of its foundation and worked there for 40 years in the Laboratory of Theoretical Physics of JINR (now the Bogoliubov Laboratory of Theoretical Physics). // From the beginning of his career Victor Ogievetsky was attracted to the study of symmetries in elementary particle physics. The

universality of the gauge principle and its applicability not only to quantum electrodynamics, but also to other types of interactions, were not fully understood at that time, but V.I. Ogievetsky quickly realized both the potential applicability and the beauty of gauge theories." – E.A. Ivanov, J. Wess.

OGIEVETSKY, Victor Isaakovich (1928-1996)**; POLUBARINOV; I. V.** *Gauge Invariant Formulation of the Neutral Vector Field Theory.* Submitted to JETP editor February 16, 1961. Offprint from: Journal Exptl. Theoretical Physics, (U.S.S.R.) 41, 247-255 (July, 1961). Russian journal version, English text. Original light blue printed wrappers. WITH manuscript mathematical annotations "Linear … Quadratic …" perhaps the hand of Abraham Pais (his ownership copy – his copy – though unsigned). Ivanov & Wess 18.

OGIEVETSKI, V. I.; POLUBARINOV, I. V. *Interaction Field of Spin 2 and the Einstein Equations.* Offprint from: *Annals of Physics,* Volume 35, No. 2, pp. 167-208, 1965. Two persons inscribed this paper "with kind regards" [to Pais] – their names are not those of the authors; publisher's insert requests a mutual exchange of offprints between scientists – referring to the names of the authors in this paper. "Ogievetsky and Polubarinov (OP) constructed spinors in coordinates in 1965, enhancing the unity of physics and helping to spawn nonlinear group representations. Roughly and locally, OP spinors resemble the orthonormal basis or tetrad formalism in the symmetric gauge, but they are conceptually self-sufficient and more economical. The tetrad formalism is thus de-Ockhamized, with six extra components and six compensating gauge symmetries. As developed nonperturbatively by Bilyalov, OP spinors admit any coordinates at a point, but 'time' must be listed first; 'time' is defined by an eigenvalue problem involving the metric and diag(-1,1,1,1), the product of which must have no negative eigenvalues. Thus even formal general covariance requires reconsideration; admissible coordinates should be sensitive to the types and _values_ of the fields. Apart from coordinate order and the usual spinorial two-valuedness, (densitized) Ogievetsky-Polubarinov spinors form, with the (conformal part of the) metric, a nonlinear geometric object, with Lie and covariant derivatives. The mild consequences of coordinate order are explored for the conventionality of simultaneity in Special Relativity and the Schwarzschild solution in General Relativity." – J. Brian Pitts, "Time and Fermions: General Covariance vs. Ockham's Razor for Spinors," – Proc. 4th Int'l Conference on Time and Matter, 4-8 March 2013, Venice. Editors Martin O'Loughlin, Samo Stani\v{c}, and Darko Veberi\v{c}. University of Nova Gorica Press (2013), pp. 185-198. Ivanov & Wess 42. [S13327][2 papers/offprints] $ 200

Okayama, Taisuke. *Many Dimensional Formulism of Physical Laws.* "大阪學藝大學紀要" [*Memoirs of Osaka Gakugei University*, no. 1, 1952]. 22 pp. Supplemental single sheet laid in (location: pp.18-19). FULL-PAGE AUTOGRAPH LETTER TO ABRAHAM PAIS FROM THE AUTHOR, WRITTEN ON FRONT COVER. The author writes, "This is a reprint from *Memoir of Osaka Gakugei University*, no. 1, 1952. I could not understand your speech well because of your language, butI thought that your w space conception was contained in my general idea..." Signed by Pais. [S13328] $ 200


Susumu Okubo

OKUBO, Susumu (1930-2015). Japanese-American theoretical physicist who spent most of his career at the University of Rochester. His work primarily focused on elementary particle physics, and contributed to the discovery of the Gell-Mann-Okubo mass formula. In 1976 he received the Nishina Memorial Prize, in 2005 the Sakurai Prize, and in 2006 the Wigner Medal. [S13329]

[11 offprints] $ 500

1. **OKUBO, S.** *Anomalous Magnetic Moment of the Nucleon.* Il Nuovo Cimento, Serie X, Vol. 6, pag. 542-558, Settembre 1957.

2. **OKUBO, S.** *Note on the Conserved Current in the Weak Interactions.* Il Nuovo Cimento, Serie X, Vol. 13, pp. 292-302, Luglio 1959. Hole-punched.

3. **OKUBO, Susumu.** *Note on Unitary Symmetry in Strong Interactions.* Offprint from: *Progress of Theoretical Physics*, Vol. 27, No. 5, pp. 949-946, May 1962.

4. **OKUBO, Susumu.** *Note on Unitary Symmetry in Strong Interaction. II. Excited States of Baryons.* Offprint from: *Progress of Theoretical Physics,* Vol. 28, No. 1, pp. 24-32, July 1962. Hole-punched.

5. **OKUBO, Susumu.** *Some Consequences of Unitary Symmetry Model.* Offprint from: *Physics Letters,* Vol. 4, No. 1, pp. 14-16, March 1, 1963.

6. **OKUBO, Susumu; Sakita, Bunji.** *Unitary Symmetry and Decay of η Meson.* Offprint from: *Physical Review Letters,* Vol. 11, No. 1, pp. 50-52, July 1, 1963. K508 1-3.

7. **OKUBO, Susumu.** *Some Consequences of Analyticity and Unitarity Conditions in Scattering Problems II.* Offprint from: *Annals of Physics,* Vol. 21, No. 2, pp. 373-382, February 1963.

8. **OKUBO, Susumu.** *Complex Angular Momentum and Domain of Holomorphy.* Il Nuovo Cimento, Serie X, Vol. 28, pp. 47-55, Aprile 10, 1963.

9. **OKUBO, Susumu.** *φ [Phi] -Meson and Unitary Symmetry Model.* Offprint from: *Physics Letters,* Vol. 5, No. 2, pp. 165-168, June 15, 1963. North-Holland Publishing Company, Amsterdam. Original orange printed wrappers.

10. **OKUBO, S.** *Intermediate Vector Mesons and Unitary Symmetry.* Offprint from: *Physics Letters,* Vol. 8, No. 5, pp. 362-364, March 1, 1964.

11. **OKUBO, Susumu.** *Algebraic identities among U(n) infinitesimal generators.* Offprint from: *Journal of Mathematical Physics,* Vol. 16, No. 3, pp. 528-35, March 1975. 2-inch tear on final leaf.
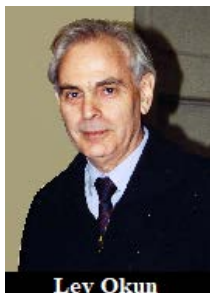
OKUN, Lev Borisovich: (1929-2015). Russian theoretical physicist, winner of the Bruno Pontecorvo Prize, the Matteucci Medal, the Landau Gold Medal, and the Pomeranchuk Prize. [S13330]

[2 offprints] $ 100

1. **OKUN, L. B. (Lev Borisovich).** *Mass Reversal and Compound Model of Elementary Particles.* From: [Proceedings 1958 Annual International Conference of High Energy Physics at CERN, 1958]. pp. 223-228. Sessions 7. Okun' was reporting from the Academy of Science, Moscow. See: Harald Fritzsch, Murray Gell-Mann (editors), *50 Years of Quarks,* 2015, page 61 etc.

2. **OKUN, L. B. (Lev Borisovich).** *Strange Particles: Decays.* Offprint from: *Annual Review of Nuclear Science,* vol. 9, pp. 61-98, 1959. Original grey printed wrappers.

OPECHOWSKI: Was affiliated with the University of British Columbia, Vancouver, BC, Canada. [S13331]   [4 offprints] $ 400

1. **OPECHOWSKI, W.** *Sur La Quantification Du Système Composé de l'électron et du Rayonnement.* Extrait de Physica, VIII, No. 2, p. 161-176, La Haye - Martinus Nijhoff – Février 1941. Brown printed wrappers. Personal marginalia of Abraham Pais within. [Abstract: Les équations de la théorie classique, telle qu'elle a été présentée par Kramers1) 2), de l'interaction entre l'électron et le rayonnement sont approximativement mises sous forme canonique et quantifiés. En accord avec l'exigence fondamentale de Kramers que la théorie classique soit formulée d'une telle façon que les questions relatives à la structure de l'électron n'y interviennent pas explicitement, on ne fait dans le présent travail aucune hypothèse relative à la nature de la masse de l'électron. Quand on compare le schéma canonique obtenu avec celui que Pauli et Fierz 3) ont proposé pour traiter le problème de l'émission des quanta de petite fréquence, l'avantage de n'introduire dans la théorie que la masse "expérimentale" de l'électron se voit particulièrement bien. On trouve alors que le hamiltonien du présent travail peut s'écrire d'une telle manière qu'il devient identique à celui de Pauliet Fierz, où l'on a cependant remplacé la masse "mécanique" qui y avait figuré par la masse "expérimentale". Dans ce sens, le schéma canonique du présent travailest une généralisation de celui de Pauli et Fierz.]

2. **OPECHOWSKI, W.; Van Santen, J. H.** *On a Generalization of the Lorentz-Lorenz Formula.* Physica XIV, no 6, pp.545-552, December 1948. Signed by Pais.

3. **OPECHOWSKI, W.** *On the Anisotropic Exchange Interaction and the Behaviour of Copper Potassium Sulphate at Very Low Temperatures.* Natuurkundig laboratorium der N.V. Philips' Gloeilampenfabrieken Eindhoven, Holland. Physica XIV, No. 4, pp. 237-248, January 1948. PERSONALLY INSCRIBED TO ABRAHAM PAIS FROM W. OPECHOWSKI.

4. **OPECHOWSKI, W.; Coxeter, H. S. M.; Wright, George F.** *A Symposium on Symmetry. (3 parts). I. Crystal Symmetry and Its Generalizations; II. Symmetry and Interaction between Elementary Particles; III. The Symmetry Sense in Chemistry.* From: *The Transactions of the Royal Society of Canada,* Third Series, Section III, Volume LI, June, 1957. pp. 1-13; 15-30; 31-44. Original mint green printed wrappers.

O'RAIFEARTAIGH, Lochlainn (1933-2000). Irish theoretical physicist, best known for discovering the O'Raifeartaigh theorem and the O'Raifeartaigh model of supersymmetry breaking. [S13332]

[6 offprints] $ 180

1. **O'RAIFEARTAIGH, L.; ŚREDNIAWA, B.; TERREAUX, CH.** *The Proton-Neutron Mass-Difference According to Meson-Theory.* Il Nuovo Cimento, Serie X, vol. 14, pp. 376-396, Ottobre 1959. Signed by Pais.

2. **O'RAIFEARTAIGH, L.; TAKAHASHI, Y.** *Further Investigation on the Non-Local Convergent Field Theory.* From: *Helvetica Physica Acta,* Vol. 34, Fasc. 6/7, pp. 554-586, 1961. Signed by Pais.

3. **O'RAIFEARTAIGH, L.** *The Dirac Matrices and the Signature of the Metric Tensor.* From: *Helvetica Physica Acta,* vol. 34, Fasc. 6/7, pp. 545-553, 1961. Signed by Pais.

4. **O'RAIFEARTAIGH, L.** *On the Validity of the Crossing Theorem.* From: *Nuclear Physics,* 35, (1962), 571-581; North-Holland Publishing Co., Amsterdam, January 15, 1962. Final leaf separated from spine.

5. **O'RAIFEARTAIGH, L.** *Probability-Conserving Transformations and Superselection Rules in Quantum Theory.* Offprint from: *Annals of Physics,* Vol. 25, No. 2, pp. 155-173, November 1963.

6. **O'RAIFEARTAIGH, L.** *S Theorem and Construction of the Invariants of the Semisimple Compact Lie Algebras.* Offprint from: *Journal of Mathematical Physics,* Vol. 5, No. 12, pp. 1796-1804, December 1964.

PAKVASA, Sandip. Professor emeritus at the University of Hawaii Manoa. [S13334]

[1 offprint] $ 20

PAKVASA, S.; Graham, R. H.; Rosen, S. P. *Parity-Conserving Hyperon Decay and the Pole Model.* Offprint from: *The Physical Review,* vol. 149, No. 4, 1200-1202, 30 September 1966. Hole-punched.

PAULI, Wolfgang. *Physik und Erkenntnistheorie.* pp. 1-3. Original yellow cover. [S13335]   SOLD

PEKAR, Solomon Isaakovich (1917-1985). Soviet theoretical physicist of Jewish origin, and member of the Ukrainian Academy of Sciences. [S13337]

[3 offprints] $ 175

1. **PEKAR, Solomon Isaakovich.** *Autolocalization of an Electron in a Dielectric Inertially Polarizing Medium.* Offprint from: *Journal of Physics,* vol. X, No. 4, pp. 347-350, 1946.

2. **PEKAR, Solomon Isaakovich.** *Local Quantum States of an Electron in an Ideal Ionic Crystal.* Offprint from: *Journal of physics,* vol. X, No. 4, pp. 341-346, 1946.

3. **PEKAR, Solomon Isaakovich.** *The method of Effective Mass for the Electron Motion in Crystals.* Offprint from: *Journal of Physics,* vol. X, No. 5, pp. 431-434, 1946.

Papers of the 1966 Summer Physics Colloquium of the PEKING Symposium. [2 papers, photostat format] [S13338] $ 50

1. **Peking.** *The Straton Model. The 1966 Summer Physics Colloquium of The Peking Symposium; On the Classification of Higher Hadron Resonances in the SU(6) Symmetry Theory.* Research Group of the Theory of Elementary particles; Physics department, Shantung University, The People's Republic of China. pp. 1-16, July, 1966. Signed by Alan [Rolats?] and Pais.

2. **Peking.** *On the Classification of Higher Hadron Resonances in The SU(6) Symmetry Theory. Papers of The 1966 Summer Physics Colloquium of The Peking Symposium; The Straton Model; Relativistic Structure Theory of Mesons and Baryons.* Research Group of the Theory of Elementary particles, Peking. The People's Republic of China. pp 1-21, July 1966. Signature present but unable to make out.

Peng Huanwu

PENG, Huanwu (1915-2007). Chinese theoretical physicist, member of the Chinese Academy of Sciences. [S13339]

[1 offprint] $ 35

PENG, H. W. *On the Cascade Production of Mesons.* From: *Proceedings of the Royal Irish Academy,* volume XLIX, Section A, No. 14, pp. 245-257, February, 1944. 49 A 14. Original yellow printed wrappers.

Donald H. Perkins

PERKINS, Donald Hill (b. 1925). British physicist and professor emeritus at the University of Oxford, St. Catherine's College, Oxford, known for his discoveries in the field of particle physics. Born in 1925, Don

Perkins studied physics at Imperial College, University of London, where he earned his undergraduate degree in 1945 and earned his doctorate in 1948. He moved to the University of Bristol in 1949. After a research stay in 1955/56 at the Lawrence Radiation Laboratory of the University of California, Berkeley (LBL), Perkins in 1956 became a reader in Bristol. He used his sabbatical years 1963/64, 1976/77 and 1983/84 for research stays at CERN in Geneva. Perkins was appointed Professor of Elementary Particle Physics at Oxford University in 1965, where he taught and researched until his retirement in 1998. Don Perkins is one of the pioneers of cosmic ray experiments using emulsion technology. He discovered in 1947 the negative π-meson on exposed films. Its π decay events are shown in many textbooks of elementary particle physics. At LBL, Perkin's experiments turned to particle accelerators. He researched K-mesons and antiproton-proton annihilation reactions. As early as 1961 he used pions in cancer therapy. At CERN, Perkins undertook high-energy neutrino scattering experiments. He is a co-discoverer of the weak neutral current in the famous Gargamelle experiment, which has demonstrated elastic neutrino-electron scattering for the first time. Using deep-inelastic neutrino-nucleon scattering, he detected quarks and antiquarks in the nucleon, determined quark and gluon densities in the nucleon and quantitatively tested quantum chromodynamics for the first time. He was involved in the design of the electron proton storage ring HERA at DESY. From 1982 Perkins devoted himself to experiments on proton decay. He found the first evidence of anomalies in the atmospheric neutrino flow, which were later interpreted as neutrino oscillations. He analyzed data on atmospheric and solar neutrinos in terms of oscillation and mixing schemes. Don Perkins has been honored and honored many times. He is an honorary doctor of the Universities of Sheffield and Bristol and a Fellow of the Royal Society, London. In recognition of his many original research in elementary particle physics, he was awarded the Guthrie Medal of the Institute of Physics in 1979, the Holweck Medal of the Institut Français de Physique in 1992, the Royal Medal of the Royal Society in 1997, and the European Physics High Energy Physics Prize in 2001 Company awarded. He has been invited to lecture and honorary lectures at universities in Toronto, Seattle, Chicago, Hawaii and Victoria / Canada. [S13341]

[2 offprints] $ 50

1. **PERKINS, D. H.; Mulvey, J. H.; Davies, J. H.; Daniel, R. R.** *Nuclear Interactions of Great Energy – Part I. Evidence for the Creation of Heavy Meson.* From: *Philosophical Magazine,* Ser. 7, vol. XLIII, pp. 753, July 1952. Signed by Pais.

2. **DANIEL, R. R.; PERKINS, Donald Hill.** *Production of Heavy Mesons by Protons of energy between 2 and 3000 GeV.* Offprint without change of pagination from; *the Proceedings of the Royal Society,* A, volume 221, pp. 351-366, 1954. Signed by Pais.

Robert W. Pidd

PIDD, Robert Wallace. (b. 1921). Professor of Physics at the University of Michigan (1949-59). [S13342]

[1 offprint] $ 35

PIDD, R. W.; Louisell, W. H.; Crane, H. R. *An Experimental Measurement of the Gyromagnetic Ratio of the Free Electron.* Offprint from: *The Physical Review,* vol. 94, No. 1, 7-16, April 1, 1954. Rubber ownership stamp of George E. Uhlenbeck (1900-1988). [Abstract: The gyromagnetic ratio of the free electron is measured by a method which is an extension of the classical double-scattering experiment. A magnetic field is interposed between the first and second scattering foils, whose direction is parallel to the path followed by the electrons. The electron spins precess in the magnetic field, resulting in a rotation of the plane of maximum asymmetry, as observed after the second scattering event. In the experiment reported, the rotation is approximately 1800 degrees. In the motion of the electron between the two scatterers the small lateral component of velocity gives rise to a "cyclotron" motion whose frequency is, theoretically, the same as the spin precession frequency to within about one part in a thousand. The cyclotron motion, therefore, furnishes a convenient reference frequency, but it also introduces problems in that it causes the asymmetries which have their origin in geometrical misalignment, finite aperture, etc., to follow the rotation of the spin asymmetry. By comparing all measurements made with the foils of high atomic number with measurements made with an aluminum foil of equal scattering power, and by further precautionary procedures and cross checks, the spin asymmetry is separated from asymmetries of other origin. The result, for 420-kev electrons and gold scatterers, is g = 2.00 ± 0.01. Plans for a more precise measurement are mentioned.]

PILKUHN, Hartmut M. [5 offprints, including:] [S13343]

1. **PILKUHN, Hartmut.** *Isospin for N+N →K+K+κπ and Similar Reactions.* From: *Nuclear Physics 22* (1961) 168-176; North-Holland Publishing Co., Amsterdam. Signed by Pais.

2. **PILKUHN, Hartmut.** *Recurrence Relations in Isospin for Statistical Weights.* Il Nuovo Cimento, Serie X, vol. 21, pp. 301-304, Luglio 1961. Signed by Pais.

3. **PILKUHN, Hartmut.** *Theoretical studies in antinucleon annihilation structures.* Arkiv För Fysik. utgivet Av kungl. Svenska Vetenskapsakademien, Band 23, nr. 25, pp. 259-271, 1962. Almqvist & Wiksell, Stockholm. Yellow printed wrappers.

4. **PILKUHN, Hartmut.** *Perturbation theory of antinucleon annihilation.* Arkiv För Fysik. utgivet Av kungl. Svenska Vetenskapsakademien, band 23, nr. 43, pp. 471-477, 1963. Almqvist & Wiksell, Stockholm. Yellow printed wrappers.

5. **PILKUHN, Hartmut.** *On Multiple Meson Productions.* Uppsala 1963, Almqvist & Wiksells Boktryckeri Ab, pp. 1-8, February 1962. Original yellow printed wrappers. INSCRIBED TO ABRAHAM PAIS WITH THE AUTHOR'S COMPLEMENTS.   [5 offprints] $ 100

Pleijel, Åke

PLEIJEL, Åke (1913-1989). Swedish mathematician and professor of mathematics at Uppsala University. [S13345]
[6 offprints] $ 100

1. **PLEIJEL, Åke.** *Asymptotic Relations for the Eigenfunctions of Certain Boundary Problems of Polar Type.* Offprint from: *American Journal of Mathematics,* vol. LXX, no. 4, pp. 892-907, October, 1948. Original pale mauve printed wrappers.

2. **PLEIJEL, Åke.; Minakshisundaram, S.** *Some Properties of the Eigenfunctions of the Laplace-Operator on Riemannian Manifolds.* Offprint

from: *the Canadian Journal of Mathematics,* vol. 1, no. 3, pp. 242-256, 1949. Original Salmon printed wrappers.

3. **PLEIJEL, Åke.** *On the Eigenvalues and Eigenfunctions of Elastic Plates.* From: *Communications on Pure and Applied Mathematics (NYU),* vol. 3, no. 1, pp. 1-10, March 1950. Original grey printed wrappers.

4. **PLEIJEL, Åke.** *On Green's Functions and the Eigenvalue-Distribution of the Three-Dimensional Membrane Equation. University of Lund, Sweden.* Comptes rendus du Douzième Congrès des Mathématiciens Scandinaves tenu à Lund 10-15 août, pp. 222-240, 1953. Gray printed wrappers.

5. **PLEIJEL, Åke.** *On the Problem of Improving Weyl's Law for the Asymptotic Eigenvalue Distribution.* Dagli "Atti del Convengo internazionale sulle Equazioni alle derivate parziali, Trieste, pp. 1-7, Agosto 1954.

6. **PLEIJEL, Åke.** *On the Eigenfunctions of the Membrane Equation in a Singular Case.* Offprint from: *Proceedings of the Conference on Differential Equations, held at the University of Maryland,* March 17, 18, 19, 1955, Sponsored jointly by the Institute for Fluid Dynamics and Applied Mathematics, University of Maryland, and the Air Force Office of Scientific Research, Air Research and Developmental Command. pp. 197-207. Original gray printed wrappers.

Boris Podolsky

PODOLSKY, Boris (1896-1966). Russian-born American physicist, remembered for his work with Einstein on wave functions and the EPR paradox. BOTH PAPERS INSRIBED BY KIKUCHI.

Chihiro Kikuchi

KIKUCHI, Chihiro, (1914-1988), received his doctorate in physics from the University of Washington (1944), began his career as Instructor Haverford College, Pennsylvania, 1943-1944, then to the University of Michigan in 1955, staying till 1982, as professor of Nuclear Engineering. Visiting research physicist Brookhaven National Laboratory, Upton, New York, 1951—1952. Technical

specialist International Atomic Energy Agency, Taiwan, 1964. International collaborator Atomic Energy Institution, Brazil, 1976—1977. He was a "specialist in the field of solid-state physics, notably the ruby maser and electron spin resonance; and advocate of nuclear power." There is a Chair named for him at Michigan. [S13346]

[2 offprints + added tear sheet] $ 200

1. **PODOLSKY, Boris; KIKUCHI, Chihiro.** *A Generalized Electrodynamics. Part II – Quantum.* Offprint from: *The Physical Review,* vol. 65, Nos. 7 and 8, pp. 228-235, April 1 and 15, 1944. Printed self-wraps; inner margin nicked. INSCRIBED: "With the author's compliments, C. Kikuchi".

2. **PODOLSKY, Boris; KIKUCHI, Chihiro.** *Auxiliary Conditions and Electrostatic Interaction in Generalized Quantum Electrodynamics.* Offprint from: *The Physical Review,* vol. 67, nos. 5 and 6, pp. 184-192, March 1 and 15, 1945. Inscribed to Abraham Pais from Chihiro Kikuchi.

   [Added] PODOLSKY, Boris. *We hear that…* Page torn away from: *Physics Today,* pp. 141, March [unknown].

PODOLANSKI, J. The author was affiliated with the University of Manchester. Two offprints: [S13348]

PODOLANSKI, J. *Unified field theory in six dimensions.* Offprint from: *Proceedings of the Royal Society,* A, vol. 201, pp. 234-260, 1950. Signed by Pais. Abstract: The geometry of the Dirac equation is actually six-dimensional. Taking this hint it is shown that a six-dimensional—classical—field theory avoids the difficulties with which the Kaluza-Klein theory has to contend. Moreover, the possibility is gained of making the field energy of a point source finite. A geometric requirement (structure axiom) decomposes the six-dimensional continuum. The space-time world appears as a subspace, immersed in the six-dimensional space. Each world point corresponds to a sheet of physically indistinguishable points. Potentials and gauge transformation can be interpreted geometrically. As a consequence of the embedding, two fields of inertial forces (fields of constraint) occur. The one behaves just as the Maxwell field; the other has negative energy and can cancel the singularities of the electromagnetic one. The theory can be made conformally invariant and then yields a relation between the mass and the charges (the sources of the constraining fields). The presentation given in this paper is provisional, as it gives infinite range also to the field of negative energy.

"He co-developed the "Armenteros-Podolanski plot" event selection technique, which is still used today in heavy ion physics." – CERN Bulletin [Issue No. 14/2004 - Monday 5 April 2004].

PODOLANSKI, J.; ARMENTEROS, Rafael (1922-2004). *Analysis of V-Events.* Offprint from: *Philosophical Magazine,* ser. 7, vol. 45, pp. 13-30, January 1954. Signed by Pais. Abstract: From the observed momenta and angles of decays in flight, variables are constructed which are better suited for the analysis than the measured quantities themselves. These variables are $1/P$, the reciprocal of the primary momentum, α, a combination of the longitudinal momenta of the secondaries, and either pt, the transverse momentum, or the quantity $\varepsilon=2pt/P$. The regularities in the distribution of the new variables, to be expected from a two-body decay, are discussed. The decay scheme may be derived by comparison with the experimental distributions.

[PODOLANSKI: 2 offprints] $ 50

RAFAEL ARMENTEROS

POLKINGHORNE, John Charlton (b. 1930). An English Theoretical physicist and theologian. Frequent commentator on the relationship between science and religion, president of Queens' College, Cambridge from 1988-1996. [S13349]

John Polinghorne

- **POLKINGHORNE, J. C.** *On the Strong Interactions.* Il Nuovo Cimento, Serie X, vol. 6, pp. 864-868, Ottobre 1957.

- **POLKINGHORNE, J. C.; Kibble, T. W. B.** *Higher Order Spinor Lagrangians.* Il Nuovo Cimento, Serie X, vol. 8, pp. 74-83, Aprile 1958. Printed self-wraps; hole-punched, cover leaf separated.

- **POLKINGHORNE, J. C.** *Renormalization of Axial Vector Coupling.* Il Nuovo Cimento, Serie X, vol. 8, pp. 179-180, Aprile 1958. Hole-punched.

[POLKINGHORNE: 3 offprints] $ 25

Richard F. Post

POST, Richard Freeman (1918-2015). American physicist whose research extended to a variety of different fields. He worked at Lawrence Livermore National Laboratory for 23 years, held a total of 34 patents, and received the James Clerk Maxwell Prize in Plasma Physics. [S13350]

[3 offprints] $ 75

1. **POST, Richard F.** *Controlled Fusion Research – An Application of the Physics of High Temperature Plasmas.* Offprint from: *Reviews of Modern Physics,* vol. 28, No. 3, pp. 338-362, July, 1956. Orange printed wrappers. "In his widely-read Reviews of Modem Physics article of 1956, Richard Post underlined the importance of fusion research to the human condition: "It appears that the continued growth of civilization as we know it will demand the achievement of practical fusion power within a period substantially less than one hundred years." He ended the article with an especially optimistic prediction regarding fusion's chances of success: "It is the firm belief of many of the physicists actively engaged in controlled fusion research in this country that all of the scientific and technological problems of controlled fusion will be mastered—perhaps in the next few years." – web source.

2. **POST, R. F.** *Summary of UCRL Pyrotron (Mirror Machine) Program.* Offprint from: *Progress in Nuclear Energy*, Series XI, vol. I—Plasma Physics and Thermonuclear Research, 1959. Original crème printed wrappers.

3. **POST, Richard F.** *High-Temperature Plasma Research and Controlled Fusion.* Offprint from: *Annual Review of Nuclear Science,* vol. 9, pp.367-436, 1959. Original grey printed wrappers.

POWELL, Cecil Frank (1903-1969) English physicist and Nobel Laureate, who developed the photographic method of studying nuclear processes and subsequently discovered the pion. During the Cold War he was a staunch opponent of nuclear proliferation. [S13351]

[6 offprints, 1 pamphlet] $ 500

1. **POWELL, Cecil Frank; Occhialini, G. P. S.; LIVESEY, D. L.; CHILTON, L. V.** *A new photographic Emulsion for the Detection of Fast Charged Particles.* Offprint from: *The Journal of Scientific Instruments,* Vol. 23, No. 5, May 1946. Signed by Pais. **Note:** Includes, Contributions to the development of the photographic method of detecting nuclear particles.

2. **LATTES, C. M. G.; MUIRHEAD, H.; OCCHIALINI, G. P. S.; POWELL, Cecil Frank.** *Processes Involving Charged Mesons.* Offprint from: *Nature,* Vol. 159, p. 694, May 24, 1947. Signed by Pais.

3. **POWELL, Cecil Frank; LATTES, C. M. G.; OCCHIALINI, G. P. S.** *Observations on the tracks of Slow Mesons in photographic Emulsions.* Offprint from: *Nature*, Vol. 160, p. 453, Oct. 4, and p. 486, Oct 11, 1947. Signed by Pais.

4. **BROWN, R.; CAMERINI, U.; FOWLER, P. H.; MUIRHEAD, H.; POWELL, Cecil Frank.** *Observations with Electron-Sensitive plates exposed to Cosmic Radiation.* Offprint from: *Nature*, Vol. 163, pp. 47 and 82, January 8 and 15, 1949. Signed by Pais.

5. **AMBROSEN, J.** *Cecil Frank Powell. Nobelpristager i Fysik for 1950.* From: *Særtryk af Fysisk Tidsskrift.* pp. 25-33. Signed by Pais.

6. **FOWLER, P. H.; MENON, M. G. K.; POWELL, Cecil Frank; ROCHAT, O.** *Masses and Modes of Decay of Heavy Mesons, Part II. τ-Particles.* Offprint from: *The Philosophical Magazine,* Ser. 7, vol. xlii, pp. 1040-1049, September 1951. Signed by Pais.

7. **POWELL, Cecil Frank.** *V-Particles and Heavy Mesons.* Offprint without change of pagination from: *the Proceedings of the Royal Society,* A, Volume 221, pp. 278-292, 1954. Signed by Pais.
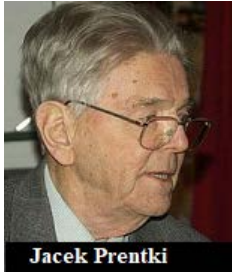
Jacek Prentki

PRENTKI, Jacek (1920-2009). French-Polish theoretical physicist, and co-founder of the CERN Theoretical Physics Department. A professor at the College of France. [S13352]

[1 offprint] $ 25

PRENTKI, J.; VELTMAN, M. *Possibility of CP Violation in Semi-Strong Interactions.* Offprint from: *CERN Service d'Information Scientifique.* Volume 15, number 1, pp.88-90, March 1, 1965.

Henry Primakoff

PRIMAKOFF, Henry (1914-1983). Russian-born theoretical physicist, remembered for discovering the Primakoff effect. He taught at the University of Pennsylvania of most of his career. "Primakoff is a versatile theorist who has made many valuable contributions to nuclear and solid state physics." – [See *Principle Contributions...*] [S13353]

[6 offprints] $ 125

1. **PRIMAKOFF, Henry; Rosen, S. P.** *Double Beta Decay.* Offprint from: *Reports on Progress in Physics,* vol. XXII, p. 121-166, 1959. Grey printed wrappers.

2. **PRIMAKOFF, Henry; Fuji, A.** *Muon Capture in Certain Light Nuclei.* Il Nuovo Cimento, Serie X, vol. 12, pp. 327-355, Maggio 1959.

3. **PRIMAKOFF, Henry** (1914-1983)**.** *Principle Contributions to Science by Henry Primakoff.* [Unknown], ca.1962. [4] pp. Printed self-wraps. This paper shows his accomplishments and publications through 1962, thus printed shortly after that point in his life. Primakoff, theoretical physicist, was born in Odessa, Russia, came to the US in 1930, studied at Columbia University and took his PhD in physics at New York University in 1938, He held several teaching positions before he joined the University of Pennsylvania as the first Donner Professor of Science in 1960. Primakoff won recognition for his research in elementary particle physics, becoming famous for his discovery of the Primakoff effect. He

was also an expert in nuclear physics and was considered one of the nation's leading physicists. He contributed to the understanding of weak interactions, double beta decay, spin waves in ferromagnetism, and the interaction between neutrinos and the atomic nucleus. He also developed the Holstein-Primakoff transformation which is designed to treat spin waves as bosonic excitations. See: Amado, Ralph D.; Mann, Alfred K., "Henry Primakoff," *Physics Today*: 72–73. December 1983.

4. **PRIMAKOFF, Henry.** *Theory of Muon Capture.* Offprint from: *Reviews of Modern Physics,* vol. 31, no. 3, pp. 802-822, July, 1959.

5. **PRIMAKOFF, Henry; Blin-Stoyle, R. J.; Gupta, V.** *Mesonic "Exchange" Effects in Beta-Decay.* Offprint from: *Nuclear Physics 11* (1959) pp. 444-453; North-Holland Publishing Co.; Amsterdam.

6. **PRIMAKOFF, Henry; Dennery, P.** *On a Method of Mass Determination for the Muon-Neutrino.* Offprint from: *Physics Letters,* vol. 6, no. 1, pp. 67-69, August 15, 1963. Orange printed wrappers.

Alexandru Proca

PROCA, Alexandru (1897-1955). Romanian physicist who studied and worked in France. After spending time as the editor of the influential physics journal *Les Annales de l'Institut Henri Poincaré,* he studied and worked with Schrödinger, Bohr, and Heisenberg. He is best remembered for discovering the Proca action and Proca equation, which describe the three massive vector bosons in the Standard Model. "His accomplishments in theoretical physics are following the developments of prominent physicists including Maxwell, Einstein and Dirac. As a young student he started to study and gave public talks on the Einstein's theory of relativity. Then his PhD thesis was dedicated to the Dirac's relativistic theory of electrons. Proca equation is a relativistic wave equation for a massive spin-1 particle. Some of the other relativistic wave eqs. are: Klein-Gordon eq. describing a massless or massive spin-0 particle; Dirac equation for a massive spin-1/2 Dirac particle; Maxwell eqs. for a massless spin-1 particle, etc. In field theory, the Proca action

describes a massive spin-1 field of mass m in Minkowski spacetime. The field involved is a real vector field. Maxwell eqs. and Proca eqs. may be found in many textbooks as important examples of relativistically invariant formulation of the field equations for a free field..." – Dorin N. Poenaru, "Alexandru Proca (1897--1955) the Great Physicist," – Cornell University Library. [S13354]

[2 offprints] $ 300

1. **PROCA, A.** *Transmutation des Particules Fondamentales Changement de Spin.* Offprint from: *Le Journal De Physique Et Le Radium,* tome 12, pp. 123-130, Février 1951. Signed by Pais.

2. **PROCA, A.** *Mécanque du Point.* Le Journal de Physique et Le Radium. Tome 15, no. 2, pp. 65-72, Février 1954. Institut Henri Poincaré, Paris. Lots of hand written notes by Proca. INSCRIBED TO PAIS AND SIGNED BY THE AUTHOR, re-titled [AS A JOKE] *The Moon and Sixpence"* and "To remember Copenhagen and a Weinerschnitzel".

Maurice Pryce

PRYCE, Maurice Henry Lecorney (1913-2003). British physicist, part of the Admiralty Signals Establishment team which developed radar in WWII. He headed the physics department at the University of Bristol from 1954 to 1964, and was a Fellow of the Royal Society, Royal Astronomical Society, Physical Society, and Cambridge Philosophical Society. [S13355]

[1 offprint] $ 100

PRYCE, M. H. L. *The mass-centre in the restricted theory of relativity and its connexion with the quantum theory of elementary particles.* Offprint from: *Proceedings of the Royal Society*, A, volume 195, pp. 62-81, 1948. [Abstract: The Newtonian definition of the mass-centre can be generalized to the restricted theory of relativity in several ways. Three in particular lead to fairly simple expressions in terms of instantaneous variables for quite general systems. Of these only one is independent of the frame in which it is defined. It suffers from the disadvantage that its components do not commute (in classical mechanics, do not have zero Poisson brackets), and are therefore unsuitable as generalized co-ordinates in mechanics. Of the other two, one is particularly, simply defined, and the other has commuting co-ordinates. The Poisson brackets can be derived from quite general considerations because the various mass-centres are expressible in terms of integrals of the energy-momentum

tensor which are directly connected with the infinitesimal operators of the group of Lorentz transformations. The definitions are readily applicable to a single particle in theories, such as are current for elementary particles, where a co-ordinate observable does not exist, but an energy-momentum tensor does, and furnish the nearest approach possible to such observables. They are applied to electrons, particles of spin 0 and $\hbar$ (scalar- and vector-meson theories), and to photons.]

RAMAN, K.; SUDARSHAN, E. C. G. *Generalized Ward-Takahashi Identities and Current Algebras.* Offprint from: *The Physical Review,* Vol. 154, No. 5, pp. 1499-1508, 25 February 1967. [Abstract: Generalized Ward-Takahashi identities are written for current algebras generated by conserved and partially conserved currents. The application to meson-baryon scattering is discussed and expressions for the scattering lengths are derived. An approximation is obtained for the real part of the low-energy forward meson-nucleon scattering amplitude; this gives sum rules for the low-energy phase shifts. Some questions arising from off-mass-shell extrapolations are discussed.] Affiliation: Physics Department, Syracuse University, Syracuse, New York. [S13356]

$ 100

Norman F. Ramsey

RAMSEY, Norman F. (1915-2011). American physicist who received the 1989 Nobel Prize in Physics for the invention of the separated oscillatory field method. Ramsey led group E-7 at the Manhattan Project, which was tasked with design and delivery of the bombs. In 1947 he joined the faculty at Harvard University, where he stayed for the next 40 years. [S13357]

[2 papers] $ 20

1. **RAMSEY, F. Norman.** *Early History of Associated Universities and Brookhaven National Laboratory. From: Brookhaven Lecture Series,* No. 55, 4to. (iii), 16 pp., March 30, 1966.

2. **RAMSEY, Norman F.** *The Atomic Hydrogen Maser.* From: *American Scientist 56,* 4, pp. 420-438, 1968.

RANFT, J.; RANFT, Gisela. *Inclusive Reactions: Models of Multi-Particle Production.* From: *Fortschritte der Physik,* 19, 393-450 (1971). Both authors were affiliated with: Sektion Physik, Karl-Marx-Universität, Leipzig, DDR. [Abstract: Model independent predictions such as Feynman scaling and the hypothesis of limiting fragmentation (HLF) for multi-particle production are reviewed. The thermodynamic model and the multi-Regge model and their description of inclusive spectra are outlined and the connection of both models is discussed with special emphasis on the predictions of these models fulfilling Feynman scaling and HLF. Various possibilities for data presentation are discussed as well as tests are proposed to distinguish between different models.] [S13358] $ 25

REES, Sir Martin John. (b. 1942). British cosmologist and astrophysicist. He has been Astronomer Royal since 1995, and served as President of the Royal Society from 2005 to 2010. The author of over 500 research papers, Rees has won numerous awards for physics and astronomy. He has spent most of his academic career at the University of Cambridge, where he served as Master of Trinity College from 2004 to 2012. [S13359]

REES, Martin F. *Quasars.* Offprint from: *The Observatory*, Vol. 98, No. 1026, pp. 210-223, 1978 October. $ 12

REGGE, Tuolio Eugenio (1931-2014). Italian theoretical physicist. Received the Dannie Heineman Prize in 1964 and the Albert Einstein Award in 1979. Regge theory and Regge calculus are named for him. [S13360]

❖ **REGGE, T.; LONGONI, A. M.; BOTTINO, A.** *Potential Scattering for Complex Energy and Angular Momentum.* 16 Marzo 1962, Il Nuovo Cimento, Serie X, Vol. 23, pag. 954-1004. Signed by Pais. $ 45

RESNIKOFF, M.; KAPLAN, L. M. *Matrix Products and the Explicit 3, 6, 9, and 12-j Coefficients of the Regular Representation of SU(n).* Offprint from: *Journal of*

Mathematical Physics, Volume8, Number 11, pp. 2194-2205, November 1967. Some insect damage present. [S13361] $ 20

RICHTMYER, Robert Davis (1910-2003). American physicist and mathematician. He worked at Los Alamos National Laboratory during WWII, and led their theoretical division after the war. He taught at UC Boulder from 1964 until his retirement, and also played violin in the Boulder Philharmonic Orchestra. [S13362]

RICHTMYER, R. D. *Electromagnetic Self-Energy of Mesotrons.* Offprint from: *The Physical Review,* Vol.57, No. 5, pp.413-416, March 1, 1940. [Abstract: We have calculated the electromagnetic self-energy of a mesotron of unit spin according to the Proca-Yukawa-Kemmer theory by an approximate method equivalent to the second order of perturbation theory. The method enables the result to be separated into various parts whose physical significance can be seen more clearly than that of the total result, but is of course open to the same objection as perturbation theory for such calculations. The various parts of the self-energy are due to the longitudinal electric field (Coulomb part), the transverse electric field (arising from the spin), the magnetic field (also from spin) and a part due to the influence of the zero point fluctuations of the radiation field on the motion and therefore on the proper field of the particle. In terms of a "cut-off radius" a, introduced to make the various contributions finite, but which will later be set equal to zero, the first and last parts diverge as $1/a2$. The second and third parts diverge as $1/a4$, but are of opposite sign and cancel to this order. The whole self-energy diverges as $1/a2$ in our approximation. These results are compared with similar ones for spins 0 and ½ recently obtained by Weisskopf." $ 45

RIESZ, Marcel (1886-1969). Hungarian mathematician who spent most of his career at the University of Lund. His brother Frigyes was also a mathematician—together they developed the F. and M. Riesz theorem. [S13363]

o **RIESZ, Marcel.** *L'équation de Dirac en Relativité Générale.* Comptes rendus du Douzième Congrès des Mathématiciens Scandinaves tenu à Lund 10-15 août 1953. pp. 241-259. Signed by Pais. $ 25

ROBERTSON, Howard Percy: (1903-1961). Notable Award: Medal for Merit (1946). An American Physicist who served with the National Defense Research Committee (NDRC) and the Office of Scientific Research and Development (OSRD). He served as Technical Consultant to the Secretary of War, the OSRD Liaison Officer in London, and the Chief of the Scientific Intelligence Advisory Section at Supreme Headquarters Allied Expeditionary Force. His fluency in German and contributions to the war effort earned him the Medal for Merit considering it helped him to interrogate German scientists, including rocket scientists involved in the V-2 rocket program. During World War II. [S13364]

[5 offprints] $ 125

1. **ROBERTSON, Howard Percy** *Kinematics and World-Structure II.* Offprint from: *The Astrophysical Journal,* Vol. 83, No.3, pp.187-201, April, 1936. Signed by Pais.

2. **ROBERTSON, Howard Percy** *Kinematics and World-Structure III.* Offprint from: *The Astrophysical Journal,* Vol. 83, No. 4, pp. 257-271 May, 1936. Signed by Pais. [Abstract: "The structure of a statistical system of particles satisfying the cosmological postulate is examined from the standpoint of the kinematics developed in the two previous parts of this paper. It is found to depend on a single arbitrary function X of two variables, in addition to the constant k and the function ... of one

variable, which specify the kinematical background of the idealized space-time. The distribution function X is interpreted as a significant constant of the motion; and the complete determination of the entire system is discussed on imposing (a), the general relativistic theory of gravitation; (b), the extension of the Newtonian theory discussed in Part II; and (c), the kinematical-statistical theory proposed by E.A. Milne. The conclusions, if not actually favorable to the relativistic theory, at least nullify certain formal objections which have been raised against it."]

3. **ROBERTSON, Howard Percy** *Test corpuscles in general relativity.* Offprint from: *Proceedings of the Edinburgh Mathematical Society,* Series 2, Vol. 5, part II, [1936]. Signed by Pais.

4. **ROBERTSON, Howard Percy** *Note on the Preceding paper: The two body problem in General Relativity.* Offprint from: *Annals of Mathematics,* Vol. 39, No. 1, pp. 101-104, January, 1938. Signed by Pais.

5. **ROBERTSON, Howard Percy** *The Invariant Theory of Isotropic Turbulence.* Offprint from: *Proceedings of the Cambridge Philosophical Society,* Vol. XXXVI, Part II, pp. 209-223, April 1940. Signed by Pais.

Professor Derek W. Robinson
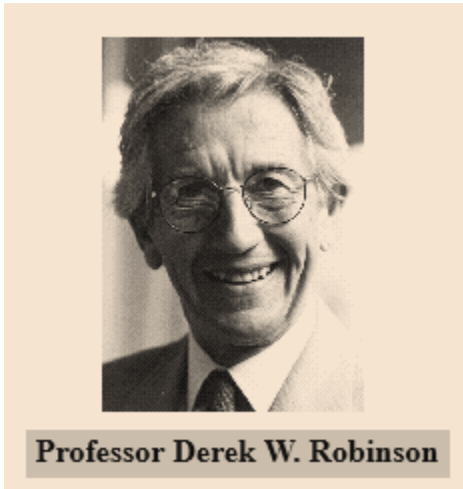
ROBINSON, Derek William (b. 1935). British physicist who spent most of his career at the Australian National University. He was former president of the Australian Mathematical Society. "Although Irish background, Derek grew up in Southern England. He was working in Switzerland, Germany, France and the USA. Derek spent ten years in Marseille as Professor of Theoretical Physics before moving to Australia. He was Professor of Mathematics at the University of New South Wales from 1978-1982. Since then he has been at the Institute of Advance Studies at the Australian National University . From 1988-1992 Derek was Chairman of the Academic Board and until 1996 he became President of the Australian Mathematical Society." – web-source. [S13365]

▪ **ROBINSON, Derek W.** *Zero-mass representations of the inhomogeneous Lorentz group.* From: *Helvetica Physica Acta,* 1962, Vol. 35, Fasc. 2, pp. 98-112. Abstract: The zero-mass representations of the inhomogeneous Lorentz group are considered as contractions of the representations for real and imaginary masses. It is shown that all zero-mass representations may be obtained from contracting either real mass or imaginary mass representations, but that it is more reasonable to associate the representations describing zero-mass particles with infinite angular momentum with contractions of the imaginary mass representations. $ 25

ROHRLICH, Fritz (b. 1921). American theoretical physicist whose work focuses on both classical and quantum electrodynamics. [S13366]

[2 offprints] $ 175

☐ **ROHRLICH, Fritz.** *The Self-Stress of the Electron.* Offprint from: *The Physical Review,* Vol. 77, No. 3, pp. 357-360, February 1, 1950. [Abstract: The diagonal elements of the symmetrical energy-momentum tensor density of an electron at rest are calculated. The covariant formalism of Tomonaga, Schwinger, Feynman, and Dyson is used, and it is shown that it is necessary to use a relativistic cut-off in addition to the covariant separation of the infinite renormalizations. Therefore "formalistic regulators" are used in the form of additional neutral vector fields. The integrations are carried out with the Feynman method. The resultant vanishing value for the self-stress constitutes a proof of the consistency of the relativistic formalism. It is also shown how the Feynman-Dyson method can be used for the calculation of expectation values of operators, of which the self-stress calculation constitutes an example.]

☐ **ROHRLICH, Fritz.** *Self-Energy and Stability of the Classical Electron.* Offprint from: *American Journal of Physics,* Vol. 28, No. 7, pp. 639-643, October, 1960. INSCRIBED TO ABRAHAM PAIS FROM THE AUTHOR:

"To Bram with best regards Fritz". [Abstract: The classical theory of the electron, as proposed by Abraham and Lorentz, is usually presented as beset by the difficulty that the momentum and velocity of its Coulomb field are incorrectly related kinematically: p = 43msv, where ms is the electromagnetic mass defined by the electromagnetic self-energy. This problem also persists in the relativistic theory. It is shown here that the difficulty is eliminated from the relativistic theory by treating the integrals over the electromagnetic field in a relativistic fashion, i.e., taking note of their dependence on the motion of the electron. The surface dependence of the integrals representing the electromagnetic momentum and energy of the particle is essential and occurs whenever the matter tensor is not introduced. The nonrelativistic limit of this formulation then also leads to the correct relationship p = msv. The corrected Abraham-Lorentz theory still contains the stability problem, but this problem is no longer related to the transformation properties. It can be removed by renormalization.]

Paul Roman

ROMAN, Paul. Hungarian-born particle physicist and mathematician. [S13367]

[1 offprint]   SOLD

ROMAN, P.; Ishida, Shin. *Static SU(6) and Fundamental Substitution.* Offprint from: *The Physical Review,* Vol. 172, No. 5, pp. 1684-1693, 25 August 1968. [Abstract: A prescription is given for avoiding the two major defects of the standard static SU(6) theory, viz., its inability to treat processes which vanish in the static limit, and the contradictory results which arise from the channel dependence of SU(6) symmetry. One crucial ingredient in our framework is what we call fundamental substitution by which we mean the substitution of a constituent quark by the corresponding antiquark, following the usual substitution law. The other essential assumption of our framework is the suppression of constituent quark-antiquark pair effects in the static limit. After formulating the framework rigorously and illustrating the procedure on a simple model, we apply it first to the analysis of the Yukawa vertex of the 56-baryon and the 36-meson multiplet. The major results are (i) A Sachs-type coupling of the 1−1 mesons and ½+ nucleons is obtained. (ii) The electric-type vector-meson-nucleon interaction is pure F, and the magnetic-type is F+D with DF=32, so that the experimentally observed relations between the electric and

magnetic form factors of the nucleons are reproduced within the framework of the vector-meson-dominance model. (iii) The 0−-½+ interaction is D+F, with DF=32. (iv) Reasonably well-satisfied coupling-constant sum rules are obtained. The method is then applied to the trilinear meson vertex, and leads to a well-satisfied sum rule. Finally, some related problems are discussed.]

ROSE, Morris Erich (1911-1967). Physicist, PhD from Michigan, worked at the Institute for Advanced Study during WWII, and afterwards at Cornell, Princeton, and the University of Virginia. Published two books: *Multipole Fields,* and, *Elementary Theory of Angular Momentum.* See: Charles P. Enz, *No Time to be Brief: A Scientific Biography of Wolfgang Pauli.* (p.307). [S13368]

❖ **ROSE, M. E.** *The Charge Distribution in Nuclei and the Scattering of High Energy Electrons.* Offprint from: *The Physical Review*, Vol. 73, No. 4, pp. 279-284, February 15, 1948. [Abstract: It is pointed out that the finite size of the nucleus will give rise to large deviations from Mott scattering when the change in wave-length of the electrons is of order of the nuclear dimensions. This deviation from Mott scattering at large scattering angles therefore provides a possibility for determination of the shape of the charge distribution and size of nuclei. In the case of a spherically symmetric charge distribution the nuclear charge density is immediately obtained from the observed angular distribution by a Fourier transform. The effects of competing processes, inelastic collisions with nuclear excitation or disintegration, atomic excitation or ionization and bremstrahlung are considered. It is shown that the first two competing effects may be disregarded if the electron energy is in the neighborhood of 50 Mev, the angle of scattering large (but not near π and if the scattered electron has an energy equal to or nearly equal to the primary energy. With the latter condition fulfilled the bremstrahlung is reduced by the same factor as the elastic scattering and the two processes are indistinguishable.] "In 1947, an American physicist, Morris Rose, working in the Oak Ridge Laboratory (which, at the time, still depended on the Manhattan Project) studied elastic electron scattering and showed that the electric charge distribution inside the nucleus could be deduced directly from the distribution of elastically scattered electrons." –Bernard Fernandez, Georges Ripka, *Unravelling the Mystery of the Atomic Nucleus: A Sixty Year Journey 1896-1956*, New York: Springer-Verlag, 2012, p. 430. $ 175

Simon Peter Rosen

ROSEN, Simon Peter (1933-2006). British-American particle physicist, known for his work on beta decay and neutrino oscillation. Spent most of his career at Purdue University, also did work at Los Alamos National Laboratory. [S13369]

[2 offprints] $ 45

1. **ROSEN, Simon Peter; PAKVASA, S.** *Nonleptonic Weak Interactions.* Offprint from: Advances in Particle Physics, vol. 2, 1968. pp. 473-565. Lower corner bumped, wrappers a bit mended.

2. **ROSEN, Simon Peter; MARATECK, S. L.** *Form Factor Resolution in K_{13} Decay.* From: *Physics Letters,* volume 29B, number 8, pp. 497-500, 21 July, 1969.

ROSENFELD, Léon (1904-1974). *Early History of Quantum Mechanics.* Offprint from: *Nature,* vol. 166, p. 883, 1950. Signed by Abraham Pais. [S13371] $ 25

Josef Rothleitner

ROTHLEITNER, Josef (1934-2011) Austrian physicist, CERN researcher and professor at Leopold-Franzens University Innsbruck. [With]: **STECH, Berthold** (b. 1924). German physicist, taught at the University of Heidelberg. [S13373]

[1 offprint] $ 45

✓ **ROTHLEITNER, Josef; STECH, Berthold.** *SU6 covariant S-Matrix formalism.* From: *Zeitschrift für Physik,* 186, 399-409 (1965).

ROZENTAL, Stefan (1903-1994). Polish-born nuclear physicist who specialized in quantum mechanics. Served as Werner Heisenberg's assistant between 1929 and 1934, and later worked as Niels Bohr's assistant for 15 years. [S13374]

➢ **ROZENTAL, Stefan.** *On the Theory of ß-Decay.* Det Kgl. Danske Videnskabernes Selskab. *Mathematisk-fysiske Meddelelser.* XVIII, 7. pp. 1-44. 1941. $ 65

Adalbert Rubinowicz

RUBINOWICZ, Adalbert [**Wojciech] Sylwester Piotr Rubinowicz** (1889-1974). Polish theoretical physicist, known for the Maggie-Rubinoqicz representation of Gustav Kirchoff's diffraction formula. [S13375]

[3 offprints] $ 175

1. **RUBINOWICZ, A.** *Dirac's One-Electron Problem in Momentum Representation.* Offprint from: *The Physical Review,* Vol. 73, No. 11, pp. 1330-1333, June 1, 1948. Signed by Pais.

2. **RUBINOWICZ, A.** *Sommerfeld's Polynomial Method in the Quantum Theory.* Offprint from: *Indagationes Mathematicae,* Vol. XI, Fasc. 2, 1949, & from: *Proceedings Koninklijke Nederlandsche Akademie van Wetenschappen,* Vol. LII, No.4, 1949. Signed by Pais.

3. **RUBINOWICZ, Adalbert.** *Le Rayonnement Multipolaire dans les Spectres Atomiques.* From: *Le Journal de Physique et le Radium,* Série VIII, Tome X, No. 5, pp. 33-44, Mai 1949. Condition note: brittle paper with considerable chipping. Signed by Pais; inscribed "With best compliments..." [not Pais' handwriting]. See: *Bibliografie von Adalbert (Wojciech) Rubinowicz (nach „Selected Papers"),* 34a.

Henri Ruegg

RUEGG, Henri. Particle physicist, spent most of his career working at CERN and is affiliated with the Dept. of Physics, Université de Genève. Received the Prize of the Minister of Education of Poland, 1993. [S13376]

RUEGG, Henri.; Volkov, D. V. *U³ X U³ Symmetry for Collinear Processes.* Offprint from: *CERN Service d'Information Scientifique.* Nuovo Cimento, Serie. X, Vol. 43, pp. 1-7, 10 Maggio, 1966. $ 25
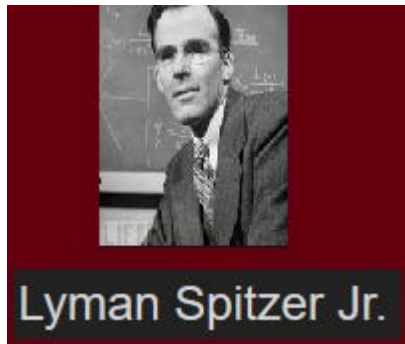

Jan Rzewuski

RZEWUSKI, Jan (1916-1994). Polish theoretical physicist and participant in the Warsaw Uprising in WWII. Received a number of awards and honors from the Polish scientific establishment. [S13377]

$ 45

☐ **RZEWUSKI, J.** *On a Possible Geometrical Interpretation of Gauge Trasformations* [sic]. Settembre, 1958, Il Nuovo Cimento, Serie. X, Vol. 9, pp. 942-949.

Lyman Spitzer Jr.

SPITZER, LYMAN, Jr. (1914-1997). "Spitzer ... was one of the 20th century's great scientists. A renowned astrophysicist, he made major contributions in the areas of stellar dynamics, plasma physics, thermonuclear fusion, and space astronomy. Lyman Spitzer, Jr. was the first person to propose the idea of

placing a large telescope in space and was the driving force behind the development of the Hubble Space Telescope. … In 1951, Spitzer founded the Princeton Plasma Physics Laboratory (originally called Project Matterhorn) which was Princeton's pioneering program in controlled thermonuclear research. He pioneered efforts to harness nuclear fusion as a clean source of energy and remained the Laboratory's director until 1967." – Denise Applewhite, Princeton University, "SPITZER, Lyman Jr." JPL, Pasadena. [S13379]

[1 offprint] $ 95

❖ **SPITZER, Lyman Jr.** *The Stellarator Concept.* Offprint from: *The Physics of Fluids,* vol. 1, no. 4, pp. 253-264, 1958. Original red printed wrappers. [Abstract]: "The basic concepts of the controlled thermonuclear program at Project Matterhorn, Princeton University are discussed. In particular, the theory of confinement of a fully ionized gas in the magnetic configuration of the stellarator is given, the theories of heating are outlined, and the bearing of observational results on these theories is described. ¶ Magnetic confinement in the stellarator is based on a strong magnetic field produced by solenoidal coils encircling a toroidal tube. The configuration is characterized by a ``rotational transform,'' such that a single line of magnetic force, followed around the system, intersects a cross- sectional plane in points which successively rotate about the magnetic axis. A theorem by Kruskal is used to prove that each line of force in such a system generates a toroidal surface; ideally the wall is such a surface. A rotational transform may be generated either by a solenoidal field in a twisted, or figure- eight shaped, tube, or by the use of an additional transverse multipolar helical field, with helical symmetry. ¶ Plasma confinement in a stellarator is analyzed from both the macroscopic and the microscopic points of view. The macroscopic equations, derived with certain simplifying assumptions, are used to show the existence of an equilibrium situation, and to discuss the limitations on material pressure in these solutions. The single- particle, or microscopic, picture shows that particles moving along the lines of force remain inside the stellarator tube to the same approximation as do the lines of force. Other particles are presumably confined by the action of the radial electric field that may be anticipated. ¶ Theory predicts and observation confirms that initial breakdown, complete ionization, and heating of a hydrogen or helium gas to about 106 degrees K are possible by means of a current parallel to the magnetic field (ohmic heating). Flow of impurities from the tube walls into the heated gas, during the discharge, may be sharply reduced by use of an ultra- high vacuum system; some improvement is also obtained with a divertor, which diverts

the outer shell of magnetic flux away from the discharge. Experiments with ohmic heating verify the presence of a hydromagnetic instability predicted by Kruskal for plasma currents greater than a certain critical value and also indicate the presence of other cooperative phenomena. Heating to very much higher temperatures can be achieved by use of a pulsating magnetic field. Heating at the positive- ion cyclotron resonance frequency has been proposed theoretically and confirmed observationally by Stix. In addition, an appreciable energy input to the positive ions should be possible, in principle, if the pulsation period is near the time between ion- ion collisions or the time required for a positive ion to pass through the heating section (magnetic pumping)."

Springer, Tonny Albert (1926-2011) mathematician, studied at Leiden University, taking his PhD under Hendrik Kloosterman, did his post-doctorate work at University of Nancy before returning to Leiden, from 1955 we lectured at Utrecht University, becoming Professor of Mathematics ordinarius (1959-1991) – then becoming professor emeritus. He was visiting professor in various places, including the Institute for Advanced Study, Princeton. Springer worked on linear algebraic groups, Hecke algebras, complex reflection groups, and who introduced Springer representations and the Springer resolution. "In 1976, Tonny Springer discovered the remarkable fact that the permutation group acts naturally on (the cohomology of) a collection of algebraic varieties, now called Springer fibers. Indeed, all of the irreducible representations - the building blocks of an arbitrary representation - can be constructed by examining the permutation action on a handful of these Springer fibers. Springer's original construction was completely algebraic but was followed by intense activity on the part of many people to give more intrinsically geometric explanations for these representations." See: J. J. O'Connor and E. F. Robertson, [biography]. [S13380]

[8 offprints] $ 200

1. **SPRINGER, T. A.** *The Projective Octave Plane.* Offprint from: "Algebraical and topological foundations of geometry." pp. 173-4. [Proceedings of a Colloquium Held in Utrecht, August 1959. Pergamon Press, 1962]. Abstract: "This chapter discusses the projective octave plane. Let a* be a line in Full-size image (3 K). On deleting a*, one gets an affine plane Full-size image (3 K) in Full-size image (3 K). One result of the analysis of the

group of K-linear transformations of Full-size image (3 K) leaving the cubic form det invariant up to a scalar factor ≠0 and inducing in Full-size image (3 K) a collineation leaving a* invariant as a whole is that Full-size image (3 K) is a translation-plane, which means that for any two points b* and c* of Full-size image (3 K) there is a unique translation in Full-size image (3 K) sending b* into c*. This implies that Full-size image (3 K) is harmonic, that is, that for any three distinct collinear points, there is a unique fourth harmonic point, which may be constructed in the usual manner. As a consequence, one obtains the result that the collination-group of Full-size image (3 K) is isomorphic with the projective group of semi-linear transformations of A leaving det invariant up to a scalar factor ≠0." – Proceedings of a Colloquium Held in Utrecht.

2. **SPRINGER, T. A.** *On a Class of Jordan Algebras.* Offprint from: *Koninkl Nederl Akademie van Wetenschappen,* series A, 62, no. 3 and Indag. Math., 21, no. 3, pp 254-264, 1959.

3. **SPRINGER, T. A.** *The Projective Octave Plane. I.* Offprint from: *Koninkl Nederl Akademie van Wetenschappen,* series A, 63, no. 1 and Indag. Math., 22, no. 1, pp. 74-101, 1960.

4. **SPRINGER, T. A.; VAN DER BLIJ, F.** *Octaves and Triality.* Offprint from: *Nieuw Archief voor Wiskunde* (3), VIII, pp. 158-169, 1960.

5. **SPRINGER, T. A.** *The Classification of Reduced Exceptional Simple Jordan Algebras. Koninkl Nederl Akademie van Wetenschappen,* series A, 63, no. 4 and Indag. Math., 22, no. 4, pp. 414-422, 1960.

6. **SPRINGER, T. A.** *Characterization of a Class of Cubic Forms.* Koninkl Nederl Akademie van Wetenschappen, series A, 65, no. 3, and Indag. Math., 24, no. 3, pp.259-265, 1962.

7. **SPRINGER, T. A.** *On the Geometric Algebra of the Octave Planes.* Koninkl Nederl Akademie van Wetenschappen, series A, 65, no. 4, and Indag. Math., 24, no. 4, pp. 451-468, 1962.

8. **SPRINGER, T. A.** *Elliptic and Hyperbolic Octave Planes. I.* Koninkl Nederl Akademie van Wetenschappen, series A, 66, no. 3, and Indag. Math., 25, no. 3, pp.413-451, 1963. There were additional parts II and III issued later, also in 1963.

Berthold Stech

STECH, Berthold (1924-): Professor Berthold Stech, University of Heidelberg (1946-1951), studied under Johannes Hans Daniel Jensen (received Nobel prize in 1963 with Maria Goeppert-Mayer for their proposal of the nuclear shell model), receiving his doctorate, becoming assistant at the Institute of Theoretical Physics [*Institut für Theoretische Physik, Heidelberg*], 1954 guest lecturer in Trondheim and 1957/58 at the Caltech (among others with Murray Gell-Mann). He dealt with chiral symmetry, the influence of quantum chromodynamics on the electroweak interaction, the quark structure of hadrons, and mesons (also with heavy quarks), neutrinophysics, and GUT [Grand Unification]. He lectured on elementary particle physics, strange particles and their interactions at the Summer Institute of Theoretical Physics held at the University of Colorado, Boulder, CO. In 1970/71 he was Dean of the Faculty of Physics and Astronomy, and in 1991 he turned emeritus. [S13381]

$ 25

- **STECH, Berthold; H. Günter DOSCH.** Predictions for Electromagnetic Formfactors of Baryons from Hybrid Groups. Offprint from: *Zeitschrift für Physik,* 189, 455-464 (1966).

J. STEINBERGER

STEINBERGER, Jack (1921-)**.** Steinberger was at the Institute for Advanced Study, Princeton. Won the 1988 Nobel Prize for Physics, along with Leon Lederman and Melvin Schwartz, "for the neutrino beam method and the demonstration of the doublet structure of the leptons through the discovery of the muon neutrino". "Jack Steinberger was a Physicist at the European Organization for Nuclear Research (CERN) (1968-1986). Other institutional affiliations include Columbia University, University of California, Berkeley, and the Institute for Advanced Studies." – AIP. [S13382]
[1 offprint]

$ 200

❖ **STEINBERGER, J.** *On the use of Subtraction Fields and the Lifetimes of Some Types of Meson Decay.* Offprint from*: Physical Review*, vol. 76, no. 8, pp. 1180-1186, October 15, 1949. Original green printed wrappers. Printed at the Lancaster press. "After receiving his doctorate, Steinberger attended the Institute for Advanced Study in Princeton for a year. In 1949 he published a calculation of the lifetime of the neutral pion, which anticipated the study of anomalies in quantum field theory" [this paper].

Yasushi Takahashi

STRATHDEE, J.: Strathdee was with the Institute for Advanced Studies, Dublin. Author of: *Partial wave analysis*, International Atomic Energy Agency, International Centre for Theoretical Physics, 1967. ¶ **Yasushi TAKAHASHI** (1924-2013), Japanese theoretical physicist, studied at Nagoya University (1951), took a Fulbright Scholarship, at University of Rochester (1953), Iowa State Univ. (1957), Dublin, Univ. of Alberta (1968). He is known for the Ward–Takahashi identity. "His dedication to the research in Quantum Electrodynamics lead to the Ward-Takahashi Identity." – [Obit.]. Memberships: Fellow of Royal Society of Canada; Fellow of American Physical Society; Member of Royal Irish Academy. "Yasushi Takahashi Obituary – Edmonton, AB, Edmonton Journal". Legacy.com. [S13383]

[2 offprints] $ 30

☐ **STRATHDEE, J.; TAKAHASHI, Yasushi** (1924-2013). *On the Self-Stress of Composite Particles.* Offprint from: *Nuclear Physics,* 8, (1958), pp. 112-123. Amsterdam: North-Holland Publishing. Abstract: "It is proved that the Pais-Epstein formula which shows the close relation between self-stress and self-energy holds true even for bound states. This formula is used to show that the self-stress of the composite particle vanishes in the rest frame, i.e. that the binding energy transforms like a mass. This makes it possible for the composite particle models proposed by many authors in connection with strange particles to join company with the relativistic particles."

☐ **STRATHDEE, J.; TAKAHASHI, Yasushi** (1924-2013). *Unrenormalizable Interactions and the Structure of Elementary Particles.* Offprint from: *Nuclear Physics,* vol. 9 (1958/59) no. 3, pp., 558-560. Original light blue printed wrappers. Amsterdam: North-Holland Publishing. Abstract: "A

possible relation of the unrenormalizable interactions to the internal structure of elementary particles is approached with the help of a simple model. A non-local, charge-independent, and CP (combined) invariant interaction is examined and a simple connection is found to emerge between the problems of parity violation in weak interactions and the divergence of self-energy. The connection involves a supposed universal fundamental length."

STRAUSS, *M. Verallgemeinerung des Planckschen Gesetzes bei Berücksichtigung der Existenz einer dritten universellen Naturkonstante.* Offprint from: Monatsberichte der Deutschen Akademie der Wisenschaften zu Berlin, band 2, heft 7, pp.412-417, 1960. "On the Possible Generalizations of Planck's Law." [S13384] $ 20

SUURA, Hiroshi (1925-1998), Hiroshima University, Ph.D., 1954. Institute for Advanced Study member: Math/NS, 9/1955–6/1957. School of Physics and Astronomy, University of Minnesota. See: Jonathan L. Rosner, *Particles in Loops - From Electrons to Top Quarks.* [S13386]
[1 offprint] $ 50
SUURA, Hiroshi. *V Particle as a Composite One.* Offprint from: Progress of Theoretical Physics, vol. 5, no. 5, pp. 893-894, 1951. SIGNED & INSCRIBED WITH AUTHOR'S COMPLIMENTS. "H. Suura considered the possibility that the V^0_1-particle is a composite particle made up of a proton and a negative pion." Andrzej K. Wróblewski, "Hypernuclei (and Strange Particles) — how it all began?" Vol. 35 (2004), *Acta Physica Polonica B*, No 3.

SYKES, M. F.; John W. ESSAM. At this time (1963) Sykes & John W. Essam were part of the Wheatstone physics Laboratory, King's College, London. By 1970 Essam was located at the Applied Mathematics Department, Brookhaven National Laboratory, Upton, Long Island, New York. [S13387]
[1 offprint] $ 35
 ➢ **SYKES, M. F.; ESSAM, J. W.** *The Crystal Statistics of the Diamond Lattice.* Offprint from: *Physica 29*, pp. 378-388, 1963. Synopsis: "The crystal statistics of the Ising Model Diamond Lattice are investigated by series methods. Unlike most three-dimensional lattices this lattice has low temperature expansions that converge up to the Curie point and this enables the specific heat and spontaneous magnetization to be estimated within narrow limits. The Curie temperature is found to be kTc/qJ −

0.6760 ± 0.0001, the critical energy Ec/kTc = 0.418 and the critical entropy Se/k = 0.511. The specific heat is found to have a logarithmic singularity as the Curie point is approached from below and the spontaneous magnetization vanishes as (Tc − T)h where h = 0.312 ± 0.002 and it is conjectured that h is exactly 5/16. The attrition parameter for the excluded volume problem is found to be μ = 2.878 ± 0.002."

Kurt Symanzik

SYMANZIK, Kurt (1923-1983), German physicist, known for his work on quantum field theory. He was born in Lyck (Ełk), East Prussia, spending his childhood in Königsberg, studied physics at the Universität München (1946), moving soon thereafter to Göttingen for study under Werner Heisenberg. He also worked with Wolfhart Zimmermann and Harry Lehmann. His PhD thesis was on the Schwinger functional in quantum field theory (1954). After teaching at Princeton and CERN he gained a full professorship at the New York Courant Institute [NYU]. In 1968 he left for the Hamburg DESY. Symanzik is most well-known for LSZ reduction formula and the Callan–Symanzik equation. His early work in non-perturbative quantum field theory together in a circle with other researches was nicknamed "Feldverein", led to now classic results. Symanzik also contributed to the Euclidean quantum field theory ansatz. Beginning in 1970 he turned his interests towards lattice gauge theory. He was awarded the Max Planck medal (1981). [S13388]

[5 offprints] $ 300

1. **SYMANZIK, Kurt.** *On the Renormalization of the Axial Vector β-Decay Coupling.* 10 ff. From: Max-Planck-Institut für Physik. München Germany. [ca.1958]. This is a pre-print issue in mimeograph form. Published later in: *Il Nuovo Cimento*, vol. 11, issue 2, 1959, pp. 269-277.

2. **SYMANZIK, Kurt.** *Ecole Normale Supérieure. Séminaire de Physique Théorique et Physique Nucléaire. Mardi, 15 Janvier,* [1957]. 5 ff. Stapled. Rare.

3. **SYMANZIK, Kurt.** *On the many-Particle Structure of Green's Functions in Quantum Filed Theory.* Offprint from: *Journal of Mathematical Physics,* vol. 1, no. 4, pp. 249-273, July-August, 1960.

4. **SYMANZIK, Kurt.** *Small Distance Behaviour in Field Theory and Power Counting.* Offprint from: *Commun. math. Phys. 18, pp. 227-246 (1970).*

5. **SYMANZIK, Kurt.** Many-Particle Structure of Green's Functions. Offprint from: *Symposia on Theoretical Physics,* vol. 3, pp. 121-170, 1967.

TAKAHASHI, Yasushi: (1924-2013), Japanese theoretical physicist, known for the Ward–Takahashi identity. Takahashi studied at Nagoya University (1951), took a Fulbright Scholarship, at University of Rochester (1953), Iowa State Univ. (1957), Dublin, Univ. of Alberta (1968). He is known for the Ward–Takahashi identity. "His dedication to the research in Quantum Electrodynamics lead to the Ward-Takahashi Identity." – [Obit.]. Memberships: Fellow of Royal Society of Canada; Fellow of American Physical Society; Member of Royal Irish Academy. "Yasushi Takahashi Obituary – Edmonton, AB, Edmonton Journal". Legacy.com. [S13389]

[see also: STRATHDEE]:   [14 offprints] $ 350

1. **TAKAHASHI, Yasushi; UMEZAWA, Hiroomi.** *On the Self-Stress.* Offprint from: *Progress of Theoretical Physics,* vol. 8, no. 2, pp. 193-204, August 1952.

2. **TAKAHASHI, Yasushi.** *On the Gauge Invariancy and the Structure of Elementary Particles.* Offprint from: *Progress of Theoretical Physics,* vol. 10, no. 3, pp. 366-367, September 1953. This paper contains edits to the text and title, probably by Abraham Pais.

3. **TAKAHASHI, Yasushi; UMEZAWA, H.** *A General Treatment of Expanding Systems. II. Application to Multiple Meson Processes.* Il Nuovo Cimento, serie X, vol. 6, pp. 1382-1391, Dicembre 1957.

4. **TAKAHASHI, Yasushi.** *Invariance and the S-matrix (II).* Offprint from: *Nuclear Physics 20,* (1960) pp. 621-629, North-Holland Publishing, Amsterdam. Signed by Abraham Pais.

5. **TAKAHASHI, Yasushi.** *The Structure of the Nucleon Core by the Hartree Approximation.* Offprint from: *Nuclear Physics 26,* (1961) pp. 658-669, North-Holland Publishing, Amsterdam.

6. **TAKAHASHI, Yasushi; JUDGE, D.; SHIMODAIRA, H.** *On the Substitution Law in Quantum Field Theory.* Offprint from: *Proceedings of the Royal Irish Academy,* vol. 61, section A, no. 6, pp. 45-54, 1961. 61 A 6. Original yellow printed wrappers. Dublin: Hodges, Figgis and Company. Signed by Abraham Pais.

7. **TAKAHASHI, Yasushi.** *A Canonical Formalism with a Linear Supplementary Condition- I.* Offprint from: *Physics Letters,* vol. 1, no. 7, pp. 278-279, July 1962.

8. **TAKAHASHI, Yasushi.** *A Canonical Formalism with a Linear Supplementary Condition- II.* Offprint from: *Physics Letters,* vol. 1, no. 7, pp 279-280, July 1962.

9. **TAKAHASHI, Yasushi; KAMEFUCHI, S.** *A Generalization of Field Quantization and Statistics.* Offprint from: *Nuclear Physics* 36 (1962) pp. 177-206, North-Holland Publishing, Amsterdam.

10. **TAKAHASHI, Yasushi.** *Relativistic Quantization of Fields (II).* Offprint from: *Nuclear Physics,* 87, (1966) pp. 481-489, North-Holland Publishing, Amsterdam. Quarter red and blue printed wrappers

11. **TAKAHASHI, Yasushi.** *Quantization of Lattice Vibrations.* Offprint from: *Annals of Physics,* vol. 45, no. 1, pp. 132-154, October 1967.

12. **TAKAHASHI, Yasushi.** *Method of Hyperquantization. I.* Offprint from: *The Physical Review,* vol. 166, no. 5, pp. 1645-1650, February 1968.

13. **TAKAHASHI, Yasushi.** *Normalization of Bethe-Salpeter Wave Functions.* Offprint from: *Symposia on Theoretical Physics and Mathematics,* vol. 6, pp. 97-101, 1968. Dublin Institute for Advanced Studies.

14. **TAKAHASHI, Yasushi.** *Non-Lagrange Theories and Generalized Conservation Laws.* Offprint from: *Symposia on Theoretical Physics and Mathematics,* vol. 6, pp. 103-109, 1968.

TAKANO, Yoshiro: Takano was part of the Dept. of Physics, Yokohama National University, Japan. [S13391]

[3 offprints] $ 45

1. **TAKANO, Yoshirô.** *Theory of Fields in Finsler Spaces. I.* Offprint from: *Progress of Theoretical Physics,* vol. 40, no. 5, pp. 1159-1180, 1968. This paper was presented at the Symposium on Differential Geometry held at Shinshu University, Matsumoto, Sept., 1966. Abstract: The theory of fields in Finsler spaces, where the fields have internal freedom, is developed. In particular, the spinor field is discussed in detail and it is found necessary to introduce the gauge fields into the equation of the spinor field. The generalizations of Finsler spaces are also attempted.

2. **TAKANO, Yoshiro.** *The singularity of Propagators in Field Theory and the Structures of Space-Time. II.* Offprint from: *Progress of Theoretical Physics,* vol. 27, no. 1, 1962, pp. 212-213. INSCRIBED BY THE AUTHOR WITH HIS COMPLIMENTS.

3. **TAKANO, Yoshiro.** Fluctuation of Space-Time and Elementary Particles. I. Offprint from: *Progress of Theoretical Physics*, vol. 38, no. 5, 1967. [pp. 1185-1187].

TANAKA, K. Tanaka was at CERN (founded 1954), Geneva, Switzerland. [S13391]

TANAKA, K. *Electromagnetic Mass Difference of Kaons. CERN.* From: *Il Nuovo Cimento,* serie X, vol. 56 A, pp. 764-770. Summary: The K+−K0 mass difference is examined, using Weinberg's first sum rule and soft-pion technique but the second sum rule is violated in which case the mass difference becomes logarithmically divergent. It is suggested that depending on the value of the coupling constants that appear in the spectral functions the correct sign of the K+−K0 mass difference can be obtained without the σ-terms. This work has been supported in part by the U.S. Atomic Energy Commission. $ 25

TANGHERLINI, Frank R. (1924-) Tangherlini, American theoretical physicist, after WWII studied at Harvard, then the University of Chicago, His first job was at Convair-General Dynamics, San Diego. He took his PhD from Stanford in 1959. "He continued his post-doctorate studies in Copenhagen (1958–1959), at the Institute of Theoretical Physics headed by Niels Bohr." Frank Robert Tangherlini has a wide field of scientific interests: the Special Theory of Relativity, the General Theory of Relativity, relativistic cosmology, Mach's principle, and many others. He authored many publications in the peer review scientific journals." – Malykin.

"Tangherlini ... suggested an original procedure which, targeting the synchronization of clocks located in two different inertial reference frames of the space, was different from that Einstein had introduced. As a result of these, Tangherlini had deduced the so-called the Tangherlini transformations, which are a sort of the transformations of the spatial coordinates and time being moved from one inertial reference frame into another one. The Tangherlini transformations differ from the Lorentz transformations (which can be meant classic ones in the theory of relativity) and, in particular, suggest the velocity of light to be anisotropic in a moving inertial reference frame. The Tangherlini transformations being applied provide adequate explanations to all well-known interference experiments checking of the Special Theory of Relativity. See: Gregory B. Malykin, "Frank Robert Tangherlini — the Founder of an Alternative Relativistic Kinematics, (On the Occasion of His 85th Birthday)." – See: Gregory B. Malykin, "Frank Robert Tangherlini — the Founder of an Alternative Relativistic Kinematics, (On the Occasion of His 85th Birthday)." Barry Cox and James Hill wrote a paper in *Proc. of the Royal Soc.*, 15 Jan. 2015, applied Tangherlini's absolute synchronization, but reapplied the "principle to the problem of tachyon localization for spinless particles," thus allowing the problem to be solved. [S13392]

[2 offprints, signed] $ 200

✓ **TANGHERLINI, F. R.** *Pion-Muon Model and Linear Mass Relations.* Offprint from: *Lettere Al Nuovo Cimento,* vol. 4, no. 14, pp. 671-677, 1972. INSCRIBED & SIGNED WITH AUTHORS COMPLIMENTS.

✓ **TANGHERLINI, F. R.** *Pion-Muon Mass Ratio and Classical Electron Models.* Offprint from: *Lettere Al Nuovo Cimento,* vol. 2, no. 3, pp. 109-114, 1971. INSCRIBED & SIGNED WITH AUTHORS COMPLIMENTS. Mathematical notations on back cover, probably belonging to Abraham Pais (his copy).

TANI, Smio: Department of Industrial Chemistry, Kyoto University. Tokyo University, now at Marquette University, Milwaukee, WI. [S13393]

[5 offprints] $ 200

1. **TANI, Smio; YAMAZAKI, Kazuo.** *On the Meaning of the Solution to the One-Body Dirac Equation.* Offprint from: *Progress of Theoretical Physics,* vol. 12, no. 6, pp. 723-746, December 1954.

2. **TANI, Smio; WATARI, Wataro.** *Connection of the Strong Coupling Theory with the Weak Coupling Theory in the Bound Meson Problem.* Offprint from: *Progress of Theoretical Physics,* vol. 14, no. 3, pp. 243-259, September 1955.

3. **TANI, Smio.** *Complete Continuity of Kernel in Generalized Potential Scattering. I. Short Range Interaction without Strong Singularity.* Offprint from: *Annals of Physics,* vol. 37, no. 3, pp. 411-450, May 1966.

4. **TANI, Smio.** *Complete Continuity of Kernel in Generalized Potential Scattering. II. Generalized Fourier Series Expansion.* Offprint from: *Annals of Physics,* vol. 37, no. 3, pp.451-486, May 1966.

5. **TANI, Smio.** *Canonical Transformation Governing Temporal Development in Classical Mechanics.* Offprint from: *American Journal of Physics,* vol. 36, no. 1, pp. 29-32, January 1968.

TER HAAR, Dirk (1919-2002) (Dr., B.Sc., M.Sc., MA, D.Sc., FRSE) an Anglo-Dutch physicist, he studied physics at Leiden University, worked as research fellow to Niels Bohr in Copenhagen, and took his Ph.D. in Leiden under Hendrik Kramers. He became professor of physics at the University of St. Andrews (1949). He was a Fellow of Magdalen College and reader in theoretical physics at the University of Oxford. Many prominent scientists studied under TER HAAR, including Anthony Leggett, winner of the Nobel Prize in Physics (2003), and Deng Jiaxian, one of the leading scientists and founders of Chinese nuclear weapon programs. [S13394]

[63 papers] $ 2,000

1. **TER HAAR, Dirk.** *On the Origin of Smoke Particles in the Interstellar Gas.* Leiden, Holland, May, 1944. pp. 288-299. Inscribed from author to Pais. Abstract: This paper attempts to give a theory of the formation of solid particles from the interstellar gas. After a brief outline in Section I of the present data pertaining to the interstellar gas and smoke in the region of the sun, a formula for the temperature of the smoke particles is derived, in Section III, supposing the smoke particles to be heteropolar crystalline particles... Finally, Section VIII gives an estimate of the maximum size of the smoke particles and discusses the total smoke density in our part of the galactic system on the assumption that the condensation has stretched over a period of the order of 10^9 years. The density of the molecules is also discussed.

2. **TER HAAR, D.** *The Vibrational Levels of an Anharmonic Oscillator.* Institute for Theoretical Physics, University of Copenhagen, Denmark. Offprint from: the *Physical Review,* Vol. 70, Nos. 3 and 4, pp. 222-223, August 1 and 15, 1946. Inscribed from author to Pais.

3. **TER HAAR, D.** *Angular Momentum of the Solar System.* Offprint from: *Nature,* Vol. 158, page 874, December 14, 1946. Inscribed to Pais from author. Abstract: One of the main difficulties to be met by any theory about the origin of the solar system is the difficulty of accounting for the present distribution of its angular momentum.

4. **TER HAAR, D.** *On the Deep Minimum in the Light Curve of Slow Novae.* July, 1946. pp. 283- 285. Offprint from: the Monthly Notices of the Royal Astronomical Society, Vol. 106, no. 4. Inscribed from author to Pais. Abstract: The deep minimum of some slow novae can probably be explained by the fact that the region between the outermost and the next shell becomes at a certain moment a H I region so that molecular formation is possible. A molecular cloud will then be formed and will produce the observed obscuration. The hypothesis that the final state of a slow nova is a planetary nebula seems to be strengthened if this process is indeed taking place.

5. **TER HAAR, Dirk.** *Planetsystemets Opstaaen.* Offprint from*: Saertryk af Fysisk Tidsskrift.* Nr. 3-6, 1946.

6. **TER HAAR, D.** *On the Redundant Zeros in the Theory of the Heisenberg Matrix.* Institute for theoretical Physics, University of Copenhagen, Denmark. *Physica* XII, no 8. November 1946. Signed by Pais as well as notes throughout. Summary: The difficulty of the redundant zeros in the theory of the characteristic matrix, which has been pointed out by Ma 4) is studied in some detail. Another difficulty inherent to the theory in its present form is pointed out.

7. **TER HAAR, D.** *Het ontstaan van ons planetenstelsel. Ned t. Natuurk,* 13, Juli—Augustus 1947. pp. 145-154. Inscribed to Pais from author.

8. **TER HAAR, D.** Notes; *Remarks on F. Cernuschi's paper, "The Physics of Cosmic Grains".* Reprinted for private circulation from: *The Astrophysical Journal,* pp. 484-485, Vol. 106, No. 3, November 1947. Inscribed from Ter Haar to Pais.

9. **TER HAAR, D.** *Recent Theories about the Origin of the Solar System.* Offprint from: *Science,* April 23, 1948, Vol. 107, no. 2782, pp. 405-411. Inscribed to Pais from author.

10. **TER HAAR, D.** *Creation of Mesons by High-Energy Particles.* Offprint from: *Science,* July 16, 1948, Vol. 108, no. 2794, pp. 57-58. Inscribed to Pais from author.

11. **TER HAAR, D.; BLEULER, Ernst.** *Angular Correlation of Scattered annihilation Radiation.* Department of Physics, Purdue University. Offprint

from: Science, July 2, 1948, Vol. 108, No. 2792, pages 10-11. (1-4). Inscribed from author to Pais.

12. **TER HAAR, D.; WERGELAND, H.** *On the Working Principle of the Hilsch Gadget.* Det Kongelige Norske Videnskabers Selskab Forhandlinger Bd. XX, nr 15. pp. 55-58. INSCRIBED to Pais from author.

13. **TER HAAR, D.; WERGELAND, H.** *On the Temperature of the Earth's Crust.* Det Kongelige Norske Videnskabers Selskab. Forhandlinger Bd Xx, Nr 14. Meddelelse Nr 165 Fra Norges Tekniske Høgskoles Fysiske Institutt. pp. 52-54, [1948]. Inscribed to Pais from author.

14. **TER HAAR, D.** *Note on the Origin of Cosmic Rays.* Offprint from: *Science,* September 16, 1949, Vol. 110, no. 2855, pp. 285-286.

15. **TER HAAR, D.** *The Energy Level density and Partition Function of Nuclei.* Offprint from: *The Physical Review,* Vol. 76, No. 10, pp. 1525-1526, November 15, 1949. Abstract: In this paper the nuclear energy level densities given by van Lier and Uhlenbeck, and by Bohr and Kalckar are compared with those given by Wergeland. It is shown that Wergeland's formula agrees slightly better with observational data. Wergeland's energy level density is then used to calculate the partition function of nuclei at a temperature of 1 Mev since this partition function enters into a discussion of the equilibrium theory of the origin of the chemical elements.

16. **TER HAAR, D.** *Helium Drie. Ned T. Natuurk,* 15, October 1949. pp. 233-242.

17. **TER HAAR, D.** *Stellar Rotation and Age.* Offprint for private circulation from: *The Astrophysical Journal,* vol. 110, No. 3, November 1949. pp. 321-328. Abstract: "Various mechanisms for reducing the rotation of an originally fast-rotating star are considered. It is found that the only one which will probably influence the stellar rotation appreciably is the interaction between the magnetic field, owing to the dipole moment of the start, and the Strömgren H II regions produced in interstellar gas clouds by stellar radiation..."

18. **TER HAAR, D.** *On the Origin of the Chemical Elements.* Offprint from: *Science,* January 28, 1949, Vol. 109, No. 2822, pages 81-82. INSCRIBED to Pais from author.

19. **TER HAAR, D.; Wergeland, H.** *The Viscosity of Mixtures of He³ and He⁴.* Offprint from: *The Physical Review,* Vol. 75, No. 5, pp. 886-887, March 1, 1949. Inscribed to Pais from author.

20. **TER HAAR, D.** *Het ontstaan van de chemische elementen.* Ned. T. Natuurk 15, April 1949. pp. 85-95.

21. **TER HAAR, D.** *"Can We Account for the observed Abundances of the Chemical Elements?"* Purdue University, Lafayette, Indiana. Offprint from: American Journal of Physics, Vol. 17, No. 5, 282-287, May, 1949. Inscribed from the author to Pais.

22. **TER HAAR, D.; Strick, E.** *Production of π-Mesons by High Energy Nucleons.* Offprint from: *The Physical Review,* Vol. 76, No. 2, pp. 304, July 15, 1949.

23. **TER HAAR, D.; Strick, E.** *Production of π-Mesons by High Energy Electrons.* Offprint from: *The Physical Review,* Vol. 78, No. 1, pp. 68-69, April 1, 1950.

24. **TER HAAR, D.** *A Phenomenological Theory of Visco-Elastic Behaviour. I & II.* Physica XVI, no 9. September 1950. pp. 719-752.

25. **TER HAAR, D.** *Further Studies on the Origin of the Solar System.* Offprint for private circulation from: *The Astrophysical Journal,* Vol. 111, No. 1, January 1950. pp. 179-190.

26. **TER HAAR, D.** *Cosmogonical Problems and Stellar Energy.* Offprint from: *Reviews of Modern Physics,* Vol. 22, No. 2, pp. 119-152, April, 1950.

27. **TER HAAR, D.; Martin B.** *Statistics of the Three-Dimensional Ferromagnet.* Offprint from: *The Physical Review,* Vol. 77, No. 5, pp. 721-722, March 1, 1950.

28. **TER HAAR, D.** *An Easy Approximate Method of Determining the Relaxation Spectrum of a Viscoelastic Material.* Offprint from: *Journal of Polymer Science,* vol. VI, number 2, February, 1951. pp. 247-250.

29. **TER HAAR, D.** *The Perfect Bose-Einstein gas in the theory of the quantum-mechanical grand canonical ensembles.* Offprint without change of

pagination from: *The Proceedings of the Royal Society,* A, volume 212, pp. 552-558, 1952. Signed by Pais.

30.   **TER HAAR, D.** *Letter to the Editor, Gentile's intermediate statistics.* Department of Natural Philosophy, St. Andrews. *Physica* XVIII, no 3. Maart 1952. p. 199. Signed by Pais.

31.   **TER HAAR, D.; Martin, B.** *Statistics of the Three-Dimensional Ferromagnet, I. The Variational Method.* Physica XVIII, no 8-9. Augustus-September 1952. pp. 569-581. Signed by Pais.

32.   **TER HAAR, D.** *Statistics of the Three-Dimensional Ferromagnet, II. Comparison of various approximation Methods.* Physica XIV, no 11. November 1952. pp. 836-840. Signed by Pais.

33.   **TER HAAR, D.** *A Molecular Sum Rule.* Offprint from: *The Proceedings of the Royal Society of Edinburgh. Section A (Mathematical and Physical Sciences).* Vol. LXIII—Part IV (no 28). pp. 381-384. Published by Oliver & Boyd, 1952. Signed by Pais.

34.   **TER HAAR, D.** *The Origin of Stars and Galaxies.* Offprint from: *The Scientific Monthly,* Vol. LXXVII, No. 6, pp. 279-288, December, 1953. Signed by Pais.

35.   **TER HAAR, D.** *The Isotherms of an imperfect gas.* Offprint from: *The Proceedings of the Cambridge Philosophical Society,* Volume 49, Part 1, pp. 130-135, 1953. Signed by Pais.

36.   **TER HAAR, D.** *On the size of Interstellar Clouds.* Zeitschrift für Astrophysik, Bd. 32, pp. 251-256 (1953). Signed by Pais.

37.   **TER HAAR, D.** *The second virial coefficient near Absolute Zero.* Offprint from: *The Proceedings of the Physical Society,* A, Vol. LXVI, pp. 847-848, 1953. Signed by Pais.

38.   **TER HAAR, D.; Green, C. D.** *The Statistical Aspect of Boltzmann's H-Theorem.* Offprint from: *The Proceedings of the Physical Society,* A, Vol. LXVI, pp. 153-159, 1953. Signed by Pais.

39.   **TER HAAR, D.** *Cosmic Cloud Hypothesis of the Origin of the Solar System.* Offprint from: *Science,* August 14, 1953, Vol. 118, No. 3059, pp. 195-196. Signed by Pais.

40.   **TER HAAR, D.** *The Age of the Universe.* Offprint from: *The Scientific Monthly,* Vol. LXXVII, No. 4, pp. 173-181. October, 1953. Signed by Pais.

41.   **TER HAAR, D.** *On Kuiper's Theory of the Origin of the Solar System.* Offprint from: *The Proceedings of the Royal Society of Edinburgh, Section A (Mathematics),* Vol. LXIV—Part I (No. 1). pp. 1-8. Published by Oliver & Boyd, 1953. Signed by Pais.

42.   **TER HAAR, D.** *Statistics of the Three-Dimensional Ferromagnet, III. Some Numerical Results.* Physica XIX, pp. 611-614, 1953. Signed by Pais.

43.   **TER HAAR, D.** *Letter to the Editor, The law of corresponding states.* Physica XIX, pp. 375-376, 1953. Signed by Pais.

44.   **TER HAAR, D.; Green, C. D.** *Fluctuations in Simple Mechanical Models.* Physica XXI, pp. 63-72, 1954.

45.   **TER HAAR, D.** *On Freundlich's Red-Shift.* Offprint from: *The Philosophical Magazine,* Ser. 7, vol. 45, March, 1954, pp. 320-324. Signed by Pais.

46.   **TER HAAR, D.** *Some more remarks on Freundlich's Red-Shift.* Offprint from: *The Philosophical Magazine,* Ser. 7, vol. 45, pp. 1023-1024, October 1954. Signed by Pais.

47.   **TER HAAR, D.; Neaves, A.** *Heat Conductivity of Semi-Conductors.* Physica XX, No. 11, p. 1, 1954. Signed by Pais.

48.   **TER HAAR, D.; Dempsey, E.** *Letter to the Editor, The three-dimensional face centred cubic ferromagnet.* Physica XX, pp. 437-439, 1954. Signed by Pais.

49.   **TER HAAR, D.; Dempsey, E.** *Letter to the Editor, The three-dimensional body-centred cubic ferromagnet.* Physica XX, pp. 667-668, 1954. Signed by Pais.

50. **TER HAAR, D.; ROSS, A. W.** *Volume Changes in a Substitutional Alloy.* Offprint from: *The Proceedings of the Physical Society,* A, Vol. LXVII, pp. 388-391, 1954. Signed by Pais.

51. **TER HAAR, D.** *Correspondence, To the Editors of "The Observatory" On the relative size of cosmic mass agglomerations.* Offprint from: The Observatory, Vol. 74, No. 880, pp. 128-129. June 1954. Signed by Pais.

52. **TER HAAR, D.** *Lambda Transition of Liquid Helium.* Offprint from: *The Physical Review,* Vol. 95, No. 4, pp. 895-897, August 15, 1954. Signed by Pais.

53. **TER HAAR, D; PODOLANSKI, J.** *The Origin of the Elements.* St. Andrews University, Scotland. [1954]. University of Manchester, England. pp. 20-41. Signed by Pais.

54. **TER HAAR, D.** *Terminology of Statistical Mechanics.* Offprint from: *American Journal of Physics,* Vol. 22, No. 9, pp. 638-639, December, 1954. Signed by Pais.

55. **TER HAAR, D.** *Foundations of Statistical mechanics.* Reprinted from Reviews of Modern Physics, Vol. 27, No. 3, 289-338, July, 1955.

56. **TER HAAR, D.** *On the use of Grand Ensembles in Statistical Mechanics: A New Derivation of Saha's Formula.* Offprint from: *American Journal of Physics, Vol. 23, No. 6, pp. 326-331, September, 1955.*

57. **TER HAAR, D.; NEAVES, A.** *On the thermo-electric power of metals.* Offprint without change of pagination from: *the Proceedings of the Royal Society,* A, volume 228, pp. 568-574, 1955.

58. **GREEN, C. D.; TER HAAR, D.** *The Ehrenfest's wind-wood model in two dimensions.* Offprint from: the Proceedings of the Cambridge Philosophical Society, Volume 51, Part 1, pp. 141-148, 1955.

59. **TER HAAR, D.** *Spontaneous vibrations of a gas column.* St. Salvator's College, St. Andrews, Scotland. *Conférence de Physique des basses températures*, Paris, 2-8, Sept. 1955. [3] pp. Signed by Pais.

60.   **TER HAAR, D.; NICOL, W. M.** *Proof of the Heisenberg Relations.* Department of Natural Philosophy, University, St. Andrews. Offprint from: Nature, Vol. 175, p. 1046, June 11, 1955.

61.   **TER HAAR, D.; COLDWELL-HORSFALL, Rosemary A.** *On the Magneto-resistance Effects in Metals.* From the: *Philosophical magazine*, Ser. 7, vol. 46, p.1149, October 1955.

62.   **TER HAAR, D.** *On the Transport Properties of Metals and Semi-Conductors.* Physica XXII, pp. 61-68, 1956. Signed by Pais.

63.   **TER HAAR, D.; DEMPSEY, E.** *Statistics of the Three-Dimensional Ferromagnet. IV: The Face Centred and Body Centred Cubic Lattices. Physica,* XXII, pp. 1-13. 1956. Signed by Pais.

Sin-Itiro Tomonaga

TOMONAGA, Sin-itiro [Sin-Itiro Tomonaga, or, Shin-ichiro] (1906-1979), prominent Japanese physicist, influential in the development of quantum electrodynamics, work for which he was jointly awarded the 1965 Nobel Prize in Physics – along with Richard Feynman and Julian Schwinger – for the study of QED, specifically for the discovery of the renormalization method. [S13395]

Nobel biography: Tomonaga completed work for Rigakushi (bachelor's degree) in physics at Kyoto Imperial University in 1929, with one of his intimate friends. Dr. Hideki Yukawa, Nobel laureate. He was engaged in graduate work for three years at the same university and was then appointed a research associate by Dr. Yoshio Nishina at the Institute of Physical and Chemical Research, Tokyo, where he started to work in a newly developed frontier of theoretical physics quantum electrodynamics - under the guidance of Dr. Nishina. His paper on the photoelectric pair creation is well-known.

Tomonaga stayed in Leipzig, Germany, from 1937 to 1939, to study nuclear physics and the quantum field theory in collaboration with the theoretical group of Dr. W. Heisenberg, where he published a paper "Innere Reibung und Wärmeleitfähigkeit der Kernmaterie", which was chosen as the thesis for Rigakuhakushi (Doctor of Science) at Tokyo Imperial University in December,1939.

In 1940, Dr. Tomonaga directed his attention to the meson theory and developed the intermediate coupling theory in order to clarify the structure of the meson cloud around the nucleon. He joined the faculty of Tokyo Bunrika University (which was absorbed into the Tokyo University of Education in 1949*) as Professor of Physics in 1941. It was in 1942 when he first proposed the covariant formulation of the quantum field theory in which the concept of the quantum state was generalized so as to be relativistically covariant.

During the Second World War, Dr. Tomonaga was interested in developing a theory of microwave systems. He solved the motion of electrons in the magnetron and also developed a unified theory of the systems consisting of wave guides and cavity resonators.

As soon as the War was over, Tomonaga came back to academic research again with a programme in which he was first to summarize and extend the intermediate coupling theory and secondly to apply the covariant field theory to actual physical systems. His aim was to investigate the nature of field reaction in the meson theory as well as in quantum electrodynamics. He was confident, prior to the Lamb-Retherford experiment, by means of a model calculation that divergence difficulty in quantumelectrodynamics could be overcome simply by handling the infinite mass and charge due to field reactions in some way or another. It was only a step further for him to develop the renormalization theory with covariant formalism in his right hand and experimental support in his left.

Dr. Tomonaga was invited to the Institute for Advanced Study, Princeton, in 1949 where he was engaged in the investigation of a one-dimensional fermion system. Thus he first succeeded in clarifying the nature of collective oscillations of a quantum-mechanical many-body system and opened a new frontier of theoretical physics, modern many-body problem. In 1955, he published an elementary theory of quantum mechanical collective motions.

Dr. Tomonaga took the leadership in establishing the Institute for Nuclear Study, University of Tokyo, in 1955. From 1956 to 1962 he was appointed President of the Tokyo University of Education and since 1963 he has been President of the Science Council of Japan and Director of the Institute for Optical Research, Tokyo University of Education. He occupies an important position in various governmental committees for scientific research and policymaking.

Tomonaga's honours and awards include the Japan Academy Prize (1948); the Order of Culture (1952); the Lomonosov Medal, U.S.S.R. (1964).

Dr. Tomonaga is a member of the Japan Academy, the Deutsche Akademie der Naturforscher "Leopoldina" and a foreign member of the Royal Swedish Academy of Science. He is a corresponding member of the Bayerische Akademie der Wissenschaften and a foreign associate of the National Academy of Science of U.S.A.

Tomonaga has published widely in scientific journals on such subjects as quantum electrodynamics, the meson theory, nuclear physics, cosmic rays, and the many-body problem. His book, "Quantum Mechanics", was published in 1949 and translated into English in 1963.

[8 offprints, 1 extract] $ 5,000

1. **TOMONAGA, Sin-itiro.** *Über den Zusammenstoß des Mesotrons mit Elektronen.* Offprint from: *Scientific Papers of the Institute of Physical and Chemical Research,* no. 976, vol. 37, pp. 399-413, June 1940. Original yellow printed wrappers. Signed by Pais. "In 1940, Dr. Tomonaga directed his attention to the meson theory and developed the intermediate coupling theory in order to clarify the structure of the meson cloud around the nucleon." – Nobel Lectures, 1972.

2. **TOMONAGA, Sin-itiro.** *Zur Theorie des Mesotrons. I.* Offprint from: *Scientific Papers of the Institute of Physical and Chemical Research,* no. 1071, vol. 39, pp. 247-266, Dezember 1941. Original yellow printed wrappers. Signed by Pais.

3. **TOMONAGA, Sin-itiro.** *Bemerkung über die Streuung der Mesotronen am Kernteilchen.* Offprint from: *Scientific Papers of the Institute of Physical and Chemical Research,* no. 1105, vol. 40, pp. 73-86, September 1942. Original yellow printed wrappers. Signed by Pais.

4. **TOMONAGA, Sin-itiro; MIYAZIMA, Tatuoki.** *Zur Theorie des Mesotrons. II.* Offprint from: *Scientific Papers of the Institute of Physical and Chemical Research,* no. 1103, vol. 40, pp. 21-67, August 1942. Original yellow printed wrappers. Signed by Pais.

5. **TOMONAGA, Sin-itiro; MIYAZIMA, Tatuoki.** *On the Mesotron Theory of the Nuclear Forces.* Offprint from: *Scientific Papers of the Institute of Physical and Chemical Research,* no. 1124, vol. 40, pp. 274-310, March 1943. Original yellow printed wrappers. Signed by Pais.

6. **TOMONAGA, Sin-itiro.** *Remarks on Bloch's Method of Sound Waves applied to Many-Fermion Problems.* Offprint from: *Progress of Theoretical Physics,* vol. 5, no. 4, pp.544-569, July-August, 1950. Signed by Pais.

7. **TOMONAGA, Shin-ichiro.** *Elementary Theory of Quantum-Mechanical Collective Motion of Particles, I.* Offprint from: *Progress of Theoretical Physics,* vol. 13, no. 5, pp.467-481, May 1955.

8. **TOMONAGA, Shin-ichiro.** *Elementary Theory of Quantum-Mechanical Collective Motion of Particles, II.* Offprint from: *Progress of Theoretical Physics,* vol. 13, no. 5, pp. 482-496, May 1955.

9. **TOMONAGA, Sin-itiro.** *Development of Quantum Electrodynamics.* Extracted from: *Physics Today,* vol. 19, no. 9, pp. 25-32, September 1966. Signed by Pais.

Sam Treiman

TREIMAN, Sam Bard (1925-1999), American theoretical physicist, known for important research in the fields of cosmic rays, quantum physics, plasma physics and gravity physics. He studied under both Enrico Fermi and John Alexander Simpson Jr. He was professor of physics at Princeton University, and member of the National Academy of Sciences and member of the JASON Defense Advisory Group. He made major contributions to the understanding of the weak interaction and he and his students are credited with developing the so-called standard model of elementary particle physics. [Biographical memoir for the *National Academy of Sciences* by Steve Adler, pg. 1]. Treiman published numerous articles on quantum mechanics, plasmas, gravity theory, condensed matter and the history of physics. "A feature of Treiman's work was his ability to devise simple, unambiguous experimental tests for theoretical predictions and phenomena." He was a close associate of Abraham Pais. [S13396]

[6 offprints] $ 275

1. **TREIMAN, S. B.** *Fermi Interactions and Hyperfragment Decay.* Pre-print: Palmer Physical Laboratory, Princeton University, [1957-59?]. 6 leaves. This work was supported by the U.S. Atomic Energy Commission and the Office of Naval Research.

2. **TREIMAN, S. B.; KHURI, N. N.; GOLDBERGER, M. L.; BLANKENBECLER, R.** *Mandelstam Representation for Potential Scattering.* Offprint from: *Annals of Physics,* vol. 10, no. 1, pp. 62-93, May 1960. Signed by Abraham Pais.

3. **TREIMAN, S. B.; KHURI, N. N.** *Pion-Pion Scattering and $K^{\pm} \rightarrow 3\pi$ Decay.* Offprint from: *The Physical Review,* vol. 119, no. 3, pp. 1115-1121, August 1960.

4. **TREIMAN, S. B.** *Weak Global Symmetry.* Offprint from: *Il Nuovo Cimento,* serie X, vol. 15, pp. 916-924, Marzo 1960. Original green printed wrappers; hole-punched. Printer: Tipografia Compositori, Bologna.

5. **TREIMAN, S. B.; YANG, C. N.** *Tests of the Single-Pion Exchange Model.* Offprint from: *Physical Review Letters,* vol. 8, no. 3, pp. 140-141, D537 1-2, February 1962.

6. **TREIMAN, S. B.; RUEGG, H.** *A Model of Weak Interactions.* Offprint from: *Il Nuovo Cimento, serie X, vol. 29, pp. 1346-1352, Settembre 1963.* Original green printed wrappers; lightly fade cover.

Hideki Yukawa

YUKAWA, Hideki: (1907-1981). Japanese theoretical physicist, and the first Japanese Nobel Laureate. He spent most of his life teaching at Kyoto University. His 1935 paper, "On the Interaction of Elementary Particles," proposed a new field theory of nuclear forces and predicted the existence of mesons—it was this discovery which led to his being awarded the Nobel Prize in Physics. [S13398]

[13 offprints, 1 hand-out] $ 4,500

1. **YUKAWA, Hideki; SAKATA, Shoichi.** *The Mass and the Life Time of the Mesotron.* Offprint from: *Proceedings of the Physico-Mathematics Society of Japan,* 3rd Ser., Vol. 21, No. 3, pp. 138-140. March, 1938.

2. **YUKAWA, Hideki; SAKATA, Shoichi; Kobayashi, Minoru; Taketani.** *On the Interaction OE Elementary Particles. IV.* Offprint from: *Proceedings of the Physico-Mathematical Society of Japan,* 3rd Ser., Vol. 20, No. 9, pp.720-745, September, 1938.

3. **YUKAWA, Hideki; SAKATA, Shoichi; TAKETANI, Mitsuo.** *On the Interaction of Elementary Particles. III. Ser. B.* Offprint from: *Proceedings of the Physico-Mathematical Society of Japan,* 3rd Ser., Vol. 20, No. 4, pp. 319-340, April, 1938.

4. **YUKAWA, Hideki.** *Models and Methods in the Meson Theory.* Offprint from: *Reviews of Modern Physics,* Vol. 21, No. 3, pp. 474-479, July, 1949. Signed by Pais.

5. **YUKAWA, Hideki.** *Remarks on Non-local Spinor Field.* Offprint from: *The Physical Review,* Vol. 76, No. 11, p. 1731, December 1, 1949. Signed by Pais.

6. **YUKAWA, Hideki.** *On the Radius of Elementary Particle.* Offprint from: *The Physical Review,* Vol. 76, No. 2, pp. 300-301, July 15, 1949. Signed by Pais.

7. **YUKAWA, Hideki.** *Letter to the Editor of The Physical Review. S-Matrix in Non-local Field Theory.* January 23, 1950. pp. 1-3. Signed by Pais. Mimeograph-form, probably distributed in small numbers.

8. **YUKAWA, Hideki.** *Special Theory of Relativity and the Structure of Elementary Particles.* Offprint from: *Progress of Theoretical Physics,* Vol. 16, No. 6, pp. 687-690, December 1956. Signed by Pais.

9. **YUKAWA, Hideki.** *Elementary Particles and Space-Time Structure.* Offprint from: *Annals of the Japan Association for Philosophy of Science,* Vol. 1, No. 2, 1956. pp. 91-100. Signed by Pais.

10. **YUKAWA, Hideki.** *Introductory Remarks on Meson Theory.* Offprint from: *Reviews of Modern Physics,* Vol. 29, No. 2, pp. 213-215, April, 1957.

11. **YUKAWA, Hideki; YAMADA, Eiji; KATAYAMA, Yasuhisa.** *Internal Structure and Symmetry of Elementary Particles. III.* Offprint from: *Progress of Theoretical Physics, Vol. 33, No. 3, March 1965.* pp. 541-542.

12. **YUKAWA, Hideki.** *Space-Time Description of Elementary Particles.* Offprint from: *Proceedings of the International Conference on Elementary Particles, 1965 Kyoto.* pp. 139-158.

13. **YUKAWA, Hideki; KATAYAMA, Yasuhisa; YAMADA, Eiji.** *Internal Structure and Symmetry of Elementary Particles. III.* Offprint from: *Progress of Theoretical Physics,* Vol. 33, No. 3, March 1965. pp. 541-2.

14. **YUKAWA, Hideki.** *Atomistics and the Divisibility of Space and Time.* Offprint from: *Progress of Theoretical Physics,* Supplement Nos. 37 & 38, (1966). pp. 511-523.

ZAHN, Charles T. (1899-1979). American physicist who worked on minesweeping for the Navy in WWII. After teaching at Caltech, Princeton, and the Universities of Michigan and Wisconsin, he spent most of his later career as a senior physicist for the National Bureau of Standards. [S13399]

ZAHN, Charles T.; Spees, A. H. *The Ratio e/m for Primary Beta-Rays from Radium E.* Offprint from: *The Physical Review,* Vol. 52, No. 5, pp. 524-525, Sept 1, 1937. $ 10

INQUIRIES & ORDERS TO:

JEFF WEBER RARE BOOKS

1815 Oak Ave, Carlsbad CA 92008

Phone: 323 333 4140
weberbks@pacbell.net

MEMBER: ABAA ILAB