

CURRICULUM VITAE

CHARLES M. HOHENBERG

Education: Princeton University, Princeton, New Jersey, B.A., 1962
University of California, Berkeley, California, Ph.D., Physics, 1968

Employment: 1962-1963:
Princeton-Pennsylvania Accelerator, Research Assistant

1963-1967:
University of California, Research Assistant

1967-1969:
University of California, Research Physicist

1970-1974:
Assistant Professor of Physics
Washington University, St. Louis, MO

1974-1978:
Associate Professor of Physics
Washington University, St. Louis, MO

Feb. 1975-Aug. 1975:
Visiting Associate Professor
Eidgenossische Technische Hochschule, Zurich
(Swiss Federal Institute of Technology)

1978-present:
Professor of Physics
Washington University, St. Louis, MO

Scientific Work:

Designed and developed new high-precision ion-counting rare gas mass spectrometer systems, built in-house, and the associated ultra-low-blank auxiliary systems capable of measuring noble gases at the thousand atom level. Applied measured abundances of various long-lived activities, and now-extinct ^{129}I and ^{244}Pu , into refined I-Xe dating schemes and developed early self-consistent models for galactic nucleosynthesis. Developed pulsed and CW laser systems for the extraction of noble gases from individual micron-sized grains. This new instrument, and its associated sampling tools, opened applications that were previously inaccessible, including: Discovery of extinct ^{129}Xe and ^{244}Pu daughter products in ancient lunar material; elemental

and isotopic measurements of noble gases in stratospheric dust particles (10^{-8} grams) and precision I-Xe dating of individual meteoritic chondrules and individual grains, allowing investigation of the individual carriers of pre-solar nucleogenic components and discovery of the first hard evidence for an early active (T-Tauri) sun, observing quantities of spallation-produced ^{21}Ne in individual meteoritic olivine grains far in excess of that due to contemporary sources of energetic particles (solar and galactic cosmic rays and secondaries); measurement of $\beta\beta$ half-lives by accumulation of heavy noble gas daughter products, including the longest half-life ever experimentally measured (8.0×10^{24} years for ^{128}Te , measured in 2 Ga native Te); refined and extended I-Xe dating, based on the accumulation of ^{129}Xe from now-extinct (17 Ma) ^{129}I (which, an r-process product, was not extinct in the early solar system) and verified this method by intercalibration with precision Pb-Pb dating methods; refined the ^{81}Kr -Kr exposure age dating method and established the ages of many prominent lunar features (Tycho, North Ray crater and South Ray crater to precisions of a few percent) and studied meteorite exposure ages and lunar surface dynamics by the same method; investigated natural ancient spontaneous chain reactions in uranium deposits (Oklo and Rabbit Lake); refined and verified the systematics of cosmic ray spallation reactions due to secondary cascades in natural material; carried out extensive isotopic of individual (pre-solar) grains, identifying that only a few percent of exocit SiC carry exotic Ne-E (essentially pure ^{22}Ne). Recent work for the Stardust Mission led to the discovery of “anomalous adsorption” and “active capture” of the heavy noble gases, new mechanisms for incorporation of heavy noble gases onto surfaces, the former involves chemical rather than Van der Waals bonds and the latter an application of this to capture heavy noble gases in a growing surface film. As a member of the Genesis and Stardust mission science teams, much recent activity has been in construction of a multiple multiplier noble gas mass spectrometer in house, and collaborative design efforts with two commercial manufacturers: Nu-Instruments and GV Instruments.

Committees and Professional Activities:

Associate Editor of the Lunar Science Conference Proceedings,
1972, 1973, 1976, 1978

Member, Lunar Science Review Panel, 1974-1977

Member, Organizing Committee, 9th Lunar Planetary Science Conference, 1978

Member, Lunar and Planetary Sample Team, 1978-1981

Chairman, Lunar and Planetary Sample Team, 1980-1981

Lunar Highlands Conference Organizing Committee, 1979

Consultant, City of Olivette (MO), Solar-assisted power for recreational facilities, 1976-1977.

Monsanto/Post Dispatch Science Fair Judge, 1979-1987
Member, Board of Directors, Coastal Communications, Ltd., 1979
Organizer, Lunar and Asteroidal Regoliths Workshops, 1980-1981
Member, International Comet Review Committee, 1980
Member, Planetary Instrument Definition Review Committee, 1981
Council Member, Meteoritical Society, 1983-1986.
Member, Lunar and Planetary Geoscience Review Panel, 1983-1986
Associate Editor, "Chondrules and their Origins", 1983
Associate Editor, Proc. Lunar Planet. Sci. Conf., 1987
Member, Scientific Organizing Committee, 51st Meteoritical Society, 1987
Member, Meteoritical Society Investment Committee, 2002 - 2004.
Member, Cosmochemistry Management Operations Working Group, 2003-2005
Member, NASA Genesis Mission Science Team, 2002-2015
Member, NASA Stardust Mission Science Team, 2002-2014

Awards and Activities:

NASA Principal Investigators Award, 1979
Presented commemorative thermal tile from first flight of
Space Shuttle Columbia, 1981
NASA Exceptional Achievement Award 1984
American Men and Women of Science
Who's Who in Science and Technology
Who's Who in Aviation and Aerospace, U.S. edition
Invited Presentation: Noble Gas Mass Spectrometers
in the 21st Century, Goldschmidt Conference, Melbourne, AU, 2006
2015 James B. Eades Award. St Louis Academy of Science
Published more than 400 articles in scientific journals

Professional Societies:

Fellow of The Meteoritical Society
St. Louis Academy of Science

Charles M. Hohenberg

Publication List (updated 9-18)

- C. M. Hohenberg, F. A. Podosek and J. H. Reynolds (1967) Xenon-iodine dating: sharp isochronism in chondrites. *Science* **156**, 233-236.
- C. M. Hohenberg, M. N. Munk and J. H. Reynolds (1967) Spallation and fissionogenic xenon and krypton from stepwise heating of the Pasamonte achondrite, the case for extinct plutonium ^{244}Pu in meteorites; relative ages of chondrites and achondrites. *J. Geophys. Res.* **72**, 3139-3177.
- C. M. Hohenberg (1967) I-Xe dating of the Shallowater achondrite. (abstract) Proc. 30th Annual Meeting of The Meteoritical Society, Moffett Field, CA.
- C. Hohenberg (1968) Isotopic studies of meteoritic xenon: a review. (abstract) Proc. 31st Annual Meeting of The Meteoritical Society, Cambridge, MA.
- C. M. Hohenberg (1968) I-Xe dating of the Shallowater achondrite, *Earth Planet. Sci. Lett.* **3**, 357-362.
- C. M. Hohenberg, Extinct radioactivities in meteorites, a paper written for the Ninninger Meteorite Award Competition (unpublished).
- C. M. Hohenberg and J. H. Reynolds (1969) Preservation of the iodine-xenon record in meteorites. *J. Geophys. Res.* **74**, 6679.
- C. M. Hohenberg (1969) Radioisotopes and the history of nucleosynthesis in the galaxy. *Science* **166**, 212-215.
- C. M. Hohenberg and M. W. Rowe (1970) Spallation yields of xenon from irradiation of Cs, Ce, Nd, D and a rare-earth mixture with 730 MeV protons. *J. Geophys. Res.* **75**, 4205.
- C. M. Hohenberg (1970) Xenon from the Angra Dos Reis meteorite. *Geochim. Cosmochim. Acta* **34**, 185.
- F. A. Podosek and C. M. Hohenberg (1970) I-Xe dating: evidence for cold assembly of an unequilibrated chondrite. *Earth Planet. Sci. Lett.* **8**, 443-447.
- J. H. Reynolds, C. M. Hohenberg, R. S. Lewis, P. K. Davis and W. A. Kaiser (1970) Isotopic analysis of rare gases from stepwise heating of lunar fines and rocks. *Science* **167**, 545.
- C. M. Hohenberg, P. K. Davis, W. A. Kaiser, R. S. Lewis and J. H. Reynolds (1970) Trapped and cosmogenic rare gases from stepwise heating of Apollo 11 samples. Proc. Apollo 11 Lunar Sci. Conf., *Geochim. Cosmochim. Acta* **34**, 1283.
- C. M. Hohenberg (1972) Xenon, Encyclopedia of Geochemistry and Environmental Sciences, Vol. IVA of Encyclopedia of Earth Sciences (Rhodes W. Fairbridge, ed.), 1270.
- C. M. Hohenberg (1972) Extinct Lunar Radioactivities: ^{144}Pu and ^{129}I xenon in Apollo 14 breccias. (abstract) Proc. of 35th Annual Meeting of the Meteoritical Society, Chicago.
- R. Drozd, C. M. Hohenberg and D. Ragan (1972) Fission xenon from extinct ^{244}Pu in 14301. *Earth Planet. Sci. Lett.* **15**, 338.

- C. M. Hohenberg, R. Drozd, and C. Behrmann (1972) ^{244}Pu and ^{129}I xenon in Apollo 14 breccias; lunar chronology with extinct radionuclides. (abstract) Proc. 1972 Amer. Geo. Union Fall Annual Meeting, 23.
- D. Burnett, C. Hohenberg, M. Maurette, M. Monnin, R. Walker and D. Woolum (1972) Solar cosmic ray, solar wind, solar flare, and neutron albedo measurements. Apollo 16 Preliminary Sci. Report, NASA SP-315, 15-19-15-32.
- G. Crozaz, R. Drozd, C. M. Hohenberg, H. P. Hoyt, Jr., D. Ragan, R. M. Walker and D. Yuhas (1972) Solar flare and galactic cosmic ray studies of Apollo 14 and 15 samples. Proc. 3rd Lunar Sci. Conf., *Geochim. Cosmochim. Acta*, Suppl. 3, **3**, 2917.
- C. Behrmann, G. Crozaz, R. Drozd, C. M. Hohenberg, C. Ralston, R. M. Walker and D. Yuhas (1972) Rare gas and particle track studies of Apollo 15 samples: Hadley Rille and special soils. (abstract) In *The Apollo 15 Lunar Samples*, (J. W. Chamberlain and C. Watkins, eds.), Lunar Science Institute, Houston, 329.
- G. Crozaz, R. Drozd, H. Graf, C. M. Hohenberg, M. Monnin, D. Ragan, C. Ralston, M. Seitz, J. Shirck, R. M. Walker and J. Zimmerman (1972) Uranium and extinct ^{244}Pu effects in Apollo 14 materials, Proc. 3rd Lunar Sci. Conf., *Geochim. Cosmochim. Acta* **2**, 1623.
- C. E. Ralston and C. M. Hohenberg (1973) Micro-erosion rates on the lunar surface, transactions. *Amer. Geo. Union* **54**, 360.
- C. Behrmann, R. Drozd, C. M. Hohenberg and C. Ralston (1973) Extinct lunar radioactivities: xenon from ^{244}Pu and ^{129}I in Apollo 14 breccias. *Earth Planet. Sci. Lett.* **17**, 446.
- C. Behrmann, G. Crozaz, R. Drozd, C. Hohenberg, C. Ralston, R. Walker, and D. Yuhas (1973) Cosmic-ray exposure history of North Ray and South Ray material. *Proc. 4th Lunar Sci. Conf.*, 1957-1974.
- R. J. Drozd, C. M. Hohenberg, and C. J. Morgan (1974) Heavy rare gases from Rabbit Lake (Canada) and the Oklo Mine (Gabon): Natural spontaneous chain reactions in old uranium deposits. *Earth Planet. Sci. Lett.* **23**, 28-33.
- R. J. Drozd, C. M. Hohenberg, C. J. Morgan, and C. E. Ralston (1974) Cosmic-ray exposure history of the Apollo 16 and other lunar sites: Lunar surface dynamics. *Geochim. Cosmochim. Acta* **38**, 1625-1642.
- R. J. Drozd, C. M. Hohenberg, and C. J. Morgan (1974) Properties of the Oklo reactor from plutonium and uranium fission xenon. Proc. International Meeting on Geochronology, Cosmochronology, and Isotope Geology, Paris.
- R. E. Arvidson, G. J. Taylor, R. J. Drozd, C. M. Hohenberg, C. Morgan and R. M. Walker (1974) Calibration of rates of mass redistribution on lunar and Martian surfaces. Proc. Amer. Chem. Soc. 168th Meeting, Atlantic City, New Jersey.
- G. Crozaz, R. Drozd, C. Hohenberg, C. Morgan, C. Ralston, R. Walker, and D. Yuhas (1974) Lunar surface dynamics: Some general conclusions and new results from Apollo 16 and 17. *Proc. 5th Lunar Sci. Conf.*, 2475-2499.
- W. C. Phinney, E. Anders, D. Bogard, P. Butler, E. Gibson, W. Gose, G. Heiken, C. Hohenberg, L. Nyquist, W. Pearce, M. Rhodes, L. Silver, D. Strangway, G. Turner, R. Walker, J. Warner

- and D. Yuhas (1974) Progress report: Apollo 17, Station 6 Boulder Consortium. Lunar Science V, The Lunar Science Institute, Houston.
- C. M. Hohenberg (1975) Horizontal transport by impact ejection, an important mixing process in the lunar regolith. *Meteoritics* **10**, 415-416.
- R. Drozd, C. Hohenberg, and C. Morgan (1975) Krypton and xenon in Apollo 14 samples: Fission and neutron capture effects in gas-rich samples. *Proc. 6th Lunar Sci. Conf.*, 1857-1877.
- R. Arvidson, R. J. Drozd, C. M. Hohenberg, C. J. Morgan and G. Poupeau (1975) Horizontal transport in the regolith, modification of features, and erosion rates on the lunar surface. *Proc. Conf. on Origin and Evolution of Lunar Regolith, Moon* **13**, 67-80.
- R. Arvidson, G. Crozaz, R. J. Drozd, C. M. Hohenberg and C. J. Morgan (1975) Cosmic ray exposure ages of features and events at the Apollo landing sites. *Proc. Conf. on Origin and Evolution of Lunar Regolith, Moon* **13**, 259-276.
- R. E. Arvidson, D. S. Burnett, R. J. Drozd, C. M. Hohenberg, C. J. Morgan and F. A. Podosek (1975) Lunar surface dynamics: Multiple exposure histories of Bench Crater samples and rates of surface processes. (abstracts) Lunar Science VI, The Lunar Science Institute, Houston.
- J. C. Dran, R. J. Drozd, J. P. Duraud, C. M. Hohenberg, C. LeGressus, D. Massignon, M. Maurette and J. O'Neil (1975) A multidisciplinary analysis of the Oklo uranium ores. The Oklo Phenomenon, 223-233, International Atomic Energy Agency Publication SM-204/12.
- R. Arvidson, R. Drozd, E. Guinness, C. Hohenberg and C. Morgan (1976) Cosmic ray exposure ages of Apollo 17 samples and the age of Tycho. *Proc. 7th Lunar Sci. Conf.*, 2817-2832.
- R. E. Arvidson, E. Guinness and C. M. Hohenberg (1977) On the constancy of the lunar cratering flux over the past 3×10^9 years. (abstract) Lunar Science VIII, 50-51, The Lunar Science Institute, Houston.
- R. J. Drozd, C. M. Hohenberg, C. J. Morgan, F. A. Podosek, and M. L. Wroge (1977) Cosmic ray exposure history at Taurus-Littrow. (abstract) Lunar Science VIII, 254-256, The Lunar Science Institute, Houston.
- R. J. Drozd, C. M. Hohenberg, C. J. Morgan, F. A. Podosek, and M. L. Wroge (1977) Cosmic ray exposure history at Taurus-Littrow. *Proc. 8th Lunar Sci. Conf.*, 3027-3043.
- T. Bernatowicz, C. M. Hohenberg, B. Hudson, B. M. Kennedy, C. J. Morgan, and F. A. Podosek (1977) Argon ages for imbrium consortium samples 14064 and 15405. Lunar Science VIII, 97-99, The Lunar Science Institute, Houston.
- T. Bernatowicz, R. J. Drozd, C. M. Hohenberg, G. Lugmair, C. J. Morgan, and F. A. Podosek (1977) The Regolith history of 14307. *Proc. 8th Lunar Sci. Conf.*, 2763-2783.
- T. J. Bernatowicz, C. M. Hohenberg, B. Hudson, B. M. Kennedy, and F. A. Podosek (1978) Excess fission xenon in Apollo 16 samples. *Proc. 9th Lunar Sci. Conf.*, 76-78.
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- T. J. Bernatowicz, C. M. Hohenberg, B. Hudson, B. M. Kennedy, and F. A. Podosek (1978) Argon ages for lunar breccias 14064 and 15405. *Proc. 9th Lunar Sci. Conf.*, 905-919.
- T. J. Bernatowicz, C. M. Hohenberg, B. Hudson, B. M. Kennedy, and F. A. Podosek (1978) Excess fission xenon at Apollo 16. *Proc. 9th Lunar Sci. Conf.*, 1571-1597.
- T. J. Bernatowicz, C. M. Hohenberg, and F. A. Podosek (1979) Surface-correlated krypton and xenon in grain size separates from breccia 14301. (abstract) *Proc. 10th Lunar and Planet. Conf.*, 104-106, Lunar and Planetary Institute, Houston.
- T. J. Bernatowicz, C. M. Hohenberg, and F. A. Podosek (1979) Xenon component organization in 14301. *Proc. 10th Lunar and Planet. Conf.*, 1587-1616.
- C. M. Hohenberg, B. Hudson, and F.A. Podosek (1979) Parentless plutonium fission xenon in troctolite 76535? (abstract) *Proc. Lunar Highland Conf.*, Lunar and Planetary Institute, Houston, 69-71.
- T. J. Bernatowicz, K. A. Goettel, C. H. Hohenberg, and F. A. Podosek (1979) Anomalous noble gases in Josephinite and associated rocks? *Earth and Planet. Sci. Lett.* **43**, 368-384.
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- S. Regnier, C. M. Hohenberg, K. Marti and R. C. Reedy (1979) Predicted versus observed cosmic-ray-produced noble gases in lunar samples: Improved Kr production rates. *Proc. 10th Lunar and Planet. Conf.*, 1565-1586.
- B. Hudson, B. M. Kennedy, C. M. Hohenberg, and F. A. Podosek (1979) Discordant relative ages of chondrites by I-Xe and $^{40}\text{Ar}/^{39}\text{Ar}$. *Meteoritics* **14**, 425-426.
- C. M. Hohenberg (1980) High sensitivity pulse-counting mass spectrometer system for noble gas analysis. *Rev. Sci. Inst.* **51**, 1075-1082.
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- B. Hudson, G.J. Flynn, P. Fraundorf, C.M. Hohenberg, and J. Shirck (1980) Rare gases in stratospheric 'Brownlee' particles: Proof of extraterrestrial origin. (abstract) *Lunar Science XI*, 492-494, Lunar and Planetary Institute, Houston.
- C. M. Hohenberg, B. Hudson, B.M. Kennedy, and F.A. Podosek (1980) Fission xenon in Troctolite 76535. In *Proc. Conf. Lunar Highlands Crust* (eds., J.J. Papike and R.B. Merrill), 419-439.
- T. J. Bernatowicz, C. M. Hohenberg, G. B. Hudson, B. M. Kennedy, and F. A. Podosek (1980) Parentless lunar radionuclear components: Acquisition and siting 14301 (abstract) *Lunar Science XI*, 70-72, Lunar and Planetary Institute, Houston.
- T. J. Bernatowicz, C.M. Hohenberg, B. Hudson, B.M. Kennedy, J.C. Laul, and F.A. Podosek (1980) Noble gas component organization in 14301, *Proc. 11th Lunar and Planet. Conf.*, 629-668.

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- R. E. Arvidson, C.M. Hohenberg, and J.R. Shirck (1981) Long term characterization of the Martian atmosphere and regolith from cosmic ray effects in returned samples. *Icarus* **45**, 250-262.
- M. Caffee, C.M. Hohenberg, and B. Hudson (1981) Troctolite 76535: A study in the preservation of early isotopic records. *Lunar Science XII*, 99-115.
- C. M. Hohenberg, B. Hudson, B.M. Kennedy, and F.A. Podosek (1981) Xenon spallation systematics in Angra dos Reis. *Geochim. Cosmochim. Acta* **45**, 1909-1915.
- B. Hudson, G.J. Flynn, P. Fraundorf, C.M. Hohenberg, and J. Shirck (1981) Noble gases in stratospheric dust particles: Proof of extraterrestrial origin, *Science* **211**, 383-386.
- F. A. Podosek, T.J. Bernatowicz, F.E. Kramer, and C. M. Hohenberg (1981) The role of adsorption in the excess fission Xe effect, (abstract) *Lunar Science XII*, 848-850, Lunar and Planetary Institute, Houston.
- C. M. Hohenberg, B. Hudson, B.M. Kennedy, and F.A. Podosek (1981) Noble gas retention chronologies for the St. Severin meteorite. *Geochim. Cosmochim. Acta* **45**, 535-546.
- Edward R. P. Scott, G.J. Taylor, A.E. Rubin, A. Okada, K. Keil, B. Hudson, and C.M. Hohenberg (1981) Graphite-magnetite inclusions - ordinary chondrites: An important constituent in the early solar system, (abstract) *Lunar Science XII*, 955-957, Lunar and Planetary Institute, Houston.
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- B. Hudson, C.M. Hohenberg, B.M. Kennedy, and F.A. Podosek (1982) ^{244}Pu in the early solar system (abstract). *Lunar and Planetary Science XIII*, 346-347.
- M. W. Caffee, C.M. Hohenberg, B. Hudson, and T.D. Swindle (1982) Shock disturbance of I-Xe systematics, (abstract). *Lunar and Planetary Science XIII*, 77-78.
- M. W. Caffee, C.M. Hohenberg, B. Hudson, and T.D. Swindle (1982) I-Xe ages of individual Bjurbole chondrules (abstract). *Lunar and Planetary Science XIII*, 75-76.
- M. W. Caffee, C. M. Hohenberg, M. M. Lindstrom and T. D. Swindle (1982) I-Xe studies of individual Allende chondrules. (abstract) *Meteoritics* **17**, 190.
- M. W. Caffee, C. M. Hohenberg and T. D. Swindle (1982) Noble gases in graphite-magnetite inclusions. (abstract) *Meteoritics* **17**, 191-192.
- M. W. Caffee, C. M. Hohenberg, F. Horz, B. Hudson, B. M. Kennedy, F. A. Podosek and T. D. Swindle (1982) Shock disturbance of the I-Xe system. Proc. 13th Lunar and Planet. Sci. Conf., *J. Geophys. Res.* **87**, A318-A330.
- C. M. Caffee, C. M. Hohenberg, B. Hudson, and T. D. Swindle (1982) I-Xe ages of individual Bjurbole chondrules. Proc. 13 Lunar and Planet. Sci. Conf., *J. Geophys. Res.* **87**, Suppl. A303-A317.

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- T. D. Swindle, M. W. Caffee, C. M. Hohenberg, and M. M. Lindstrom (1983) I-Xe studies of individual Allende chondrules. *Geochim. Cosmochim. Acta*, **47**, 2157-2177.
- M. W. Caffee, J. N. Goswami, C. M. Hohenberg, and T. D. Swindle (1983) Cosmogenic neon from pre-compaction irradiation of Murchison and Kapoeta. (abstract) *Lunar and Planetary Science XIV*, 86-87.
- T. D. Swindle, M. W. Caffee, and C. M. Hohenberg (1983) Xenon in irradiated chondrules. (abstract) *Lunar and Planetary Science XIV*, 767-768.
- C. M. Hohenberg, M. W. Caffee, T. D. Swindle, G. B. Hudson, G. J. Wasserburg (1983) I-Xe ages of Allende inclusions. (abstract) *Meteoritics* **18**, 313.
- M. W. Caffee, J. N. Goswami, C. M. Hohenberg and T. D. Swindle (1983) Cosmogenic neon from pre-compaction irradiation of Kapoeta and Murchison. Proc. 14th Lunar Planet. Sci. Conf. *J. Geophys. Res.* **88**, B267-B273.
- C. M. Hohenberg, M. W. Caffee and T. D. Swindle (1983) Boundary conditions on the early sun from ancient cosmogenic neon in meteorites. (abstract) Workshop on Past and Present Solar Radiation: The Record in Meteoritic and Lunar Regolith Material, Mainz, Germany.
- T. D. Swindle, M. W. Caffee, and C. M. Hohenberg (1984) Radiometric ages of chondrules. In: *Chondrules and Their Origins*, (E. King, ed.), Lunar Planetary Institute, Houston, 246-261.
- T. D. Swindle, M. W. Caffee, C. M. Hohenberg and B. Hudson (1984) Noble gas component organization in 14318. (abstract) *Lunar and Planetary Science XV*, Houston, TX., 838-839.
- M. W. Caffee, C. M. Hohenberg and T. D. Swindle (1984) Laser extraction of neon from Dimmitt: Preliminary report. (abstract) *Lunar and Planetary Science XV*, Houston, TX, 114-115.
- C. M. Hohenberg (1984) Solar system history: Chronology. (abstract) Inv. paper, American Chemical Society Meeting, St. Louis, MO.
- M. W. Caffee, J. N. Goswami, C. M. Hohenberg and T. D. Swindle (1984) Precompaction irradiation effects: Particles from an early active sun? (abstract) Workshop on Cosmogenic Nuclides, Los Alamos, NM.
- M. W. Caffee, C. M. Hohenberg, T. D. Swindle and J. N. Goswami (1984) Confirmation of cosmogenic neon from precompaction irradiation of Kapoeta and Murchison. (abstract) *Meteoritics* **19**, 203.
- T. D. Swindle, M. W. Caffee, C. M. Hohenberg and R. S. Rajan (1984) Noble gases in SNC meteorites. (abstract) *Meteoritics* **19**, 318-319.
- T. D. Swindle, M. W. Caffee and C. M. Hohenberg (1984) The I-Pu-Xe age of the moon. (abstract) *Conference on the Origin of the Moon*, Hawaii.
- T. D. Swindle, M. W. Caffee, C. M. Hohenberg, G. B. Hudson, J. C. Laul, S. B. Simon and J. J. Papike (1985) Noble gas component organization in 14318: ^{129}I and ^{244}Pu Regolith Chronology. Proc. 15th Lunar and Planet. Sci. Conf., *J. Geophys. Res.* **90**, C517-C539.

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- M. W. Caffee, J. N. Goswami, C. M. Hohenberg and T. D. Swindle (1985) Pre-compaction irradiation of meteorite grains: further constraints. (abstract) *Lunar Planet. Sci. XVI*, 103-104.
- M. W. Caffee, J. N. Goswami, C. M. Hohenberg and T. D. Swindle (1985) Evidence in Meteorites for an active early sun. (ext.abstract) *Lunar Planetary Science XVI*.
- M. W. Caffee, J. N. Goswami, C. M. Hohenberg, and T. D. Swindle (1985) Pre-compaction irradiation of Kapoeta: $^{40}\text{Ar}/^{39}\text{Ar}$ ages of individual grains. (abstract) 48th Annual Meteoritical Society Meeting, Bordeaux, France, *Meteoritics* **20**, 620-622.
- T. D. Swindle, M. W. Caffee and C. M. Hohenberg (1985) I-Xe structures of chondrules, rims and matrix in Chainpur. (abstract) 48th Annual Meteoritical Society Meeting, Bordeaux, France, *Meteoritics* **20**, 767-768.
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