## Publications by E. M. "Gene" Shoemaker

Publications per Year: 1948 to 1999:

http://aipg-tx.org/ docs/ShoemakerPubs.pdf

# 1948

1. Shoemaker, E.M., 1948, Petrology of the Hopewell Series in the Ojo Caliente of New Mexico: California Institute of Technology, unpublished Masters Thesis.

### 1953

2. Shoemaker, E.M., 1953, Thirty selected papers -- an annotated bibliography of the Colorado Plateau: U.S. Geological Survey, 6 p.

## 1954

3. Shoemaker, E.M., 1954, Structural features of southeastern Utah and adjacent parts of Colorado, New Mexico, and Arizona: Utah Geological Society, Guidebook to the Geology of Utah, no. 9, p. 48-69.

### 1955

4. Shoemaker, E.M., 1955, Preliminary geologic map of the Juanita Arch quadrangle, Colorado: U.S. Geological Survey Mineral Investigation Field Studies Map, MF-28.

 Shoemaker, E.M., 1955, Geology of the Juanita Arch quadrangle, Colorado: U.S. Geological Survey Quadrangle Map GQ 81.
 Shoemaker, E.M., 1955, Preliminary map of the Rock Creek quadrangle, Colorado: U.S. Geological Survey Mineral Investigation Field Studies Map, MF-23.

## 1956

7. Shoemaker, E.M., 1956, Geology of the Rock Creek quadrangle, Colorado: U.S. Geological Survey Quadrangle Map GQ 83.

8. Shoemaker, E.M., 1956, Occurrence of uranium in diatremes on the Navajo and Hopi Reservations, Arizona, New Mexico, and Utah: United Nations, Geology of Uranium and Thorium: International Conference on Peaceful Uses of Atomic Energy, Geneva, August 1955, Proceedings, v. 6, p. 412-417. Slightly revised, in Page, L.R., Contributions to the geology of uranium and thorium...: U.S. Geological Survey Professional Paper 300, p. 179-185.

9. Shoemaker, E.M., 1956, Precambrian rocks of the north-central Colorado Plateau: Intermountain Association of Petroleum Geologists Field Conference, 7th, Annual Field Conference, p. 54-59.

10. Shoemaker, E.M., 1956, Structural features of the central Colorado Plateau and their relation to uranium deposits, in Page, L.R., Contributions to the geology of uranium and thorium ...: U.S. Geological Survey Professional Paper 300, p. 155-170.

## 1958

11. Shoemaker, E.M., Case, J.E., and Elston, D.P. 1958, Salt anticlines of the Paradox Basin: Intermountain Association of Petroleum Geologists, Guidebook, 9th, Annual Field Conference, p. 39-59.

## 1959

12. Shoemaker, E.M., Miesch, A.T., Newman, W.L., and Riley, L.B., 1959, Elemental composition of the sandstone-type deposits, in Garrels, R.M., and Larsen, E.S., ed., Compilers, Geochemistry and Mineralogy of the Colorado Plateau uranium ores: U.S. Geological Survey Professional Paper 320, p. 25-54.

13. Shoemaker, E.M., and Newman, W.L., 1959, Moenkopi Formation (Triassic? and Triassic) in the salt anticline region, Colorado and Utah: American Association of Petroleum Geologists Bulletin, v. 43, no. 8, p. 1835-1851.

### 1960

14. Shoemaker, E.M., 1960, Impact mechanics at Meteor Crater Arizona, unpublished Princeton PhD Thesis, 55 pp.

15. Chao, E.C.T., Shoemaker, E.M., and Madsen, B.M. 1960, First natural occurrence of coesite from Meteor Crater, Arizona: Science, v. 132, no. 3421, p. 220-222.

16. Elston, D.P., and Shoemaker, E.M., 1960, Late Paleozoic and early Mesozoic structural history of the Uncompanyer front: Four Corners Geological Society, 3rd Field Conference, Guidebook, p. 47-55.

17. Miesch, A.T., Shoemaker, E.M. Newman, W.L., and Finch, W.I., 1960, Chemical composition as a guide to the size of sandstone-type uranium deposits in the Morrison Formation on the Colorado Plateau: U.S. Geological Survey Bulletin, 1112-B, p. 17-61.

18. Shoemaker, E.M., 1960, Ballistics of the Copernican ray system: Lunar and Planetary Exploration Colloquium, Proceedings, v. 2, no. 2, p. 7-21.

19. Shoemaker, E.M., 1960, Brecciation and mixing of rock by strong shock: Article 192: U.S. Geological Survey Professional Paper 400-B, p. B423-B425.

20. Shoemaker, E.M., 1960, Penetration mechanics of high velocity meteorites, illustrated by Meteor Crater, Arizona: International Geological Congress, 21st, Copenhagen, 1960, Report, pt. 18, p. 418-434.

## 1961

21. Eggleton, R.E., and Shoemaker, E.M., 1961, Breccia at Sierra Madera, Texas: Article 342: U.S. Geological Survey Professional Paper 424-D, p. D151-D153.

22. Elston, D.P., and Shoemaker, E.M., 1961, Preliminary structure contour map on top of salt in the Paradox Member of the Hermosa Formation in the Salt Anticline region, Colorado and Utah: U.S. Geological Survey Oil and Gas Investigation Map OM 209.

23. Landis, E.R., Shoemaker, E.M., and Elston, D.P., 1961, Early and late growth of the Gypsum Valley salt anticline, San Miguel County, Colorado: U.S. Geological Survey Professional Paper 424-C, p. 131-136.

24. Shoemaker, E.M., 1961, Ballistics and throwout calculations for the lunar crater Copernicus: Proceedings of the Geophysical Laboratory/Lawrence Radiation Laboratory Cratering Symposium, Washington, D.C., pt. 2: University of California, Livermore, Report UCRL-6438, Paper Q, 31 p. (Report prepared for U.S. Atomic Energy Commission). 25. Shoemaker, E.M., and Chao, E.C.T., 1961, New evidence for the impact origin of the Ries Basin, Bavaria, Germany: Journal of Geophysical Research, v. 66, no. 10, p. 3371-3378.

26. Shoemaker, E.M., and Chao, E.C.T., 1961, New evidence for the impact origin of the Ries Basin, Bavaria, Germany: Proceedings of the Geophysical Laboratory/Lawrence Radiation Laboratory Cratering Symposium, Washington, D.C., part 1: University of California, Livermore, Report UCRL-6438, Paper B, 13 p. (Report prepared for the U.S. Atomic Energy

#### Commission).

27. Shoemaker, E.M., and Eggleton, R.E., 1961, Terrestrial features of impact origin: Proceedings of the Geophysical Laboratory/Lawrence Radiation Laboratory Cratering Symposium, Washington, D.C., part 1: University of California, Livermore, Report UCRL-6438, Paper A, 27 p. (Report prepared for the U.S. Atomic Energy Commission). 28. Shoemaker, E.M., Gault, D.E., and Lugn, R.V., 1961, Shatter cones formed by high-speed impact in dolomite: Article 417: U.S. Geological Survey Professional Paper 424-D, p. D365-D368. 29. Moore, H.J., Gault, D.E., Lugn, R.V., and Shoemaker, E.M., 1961, Hypervelocity impact of steel into Coconino sandstone: Proceedings

of the Geophysical Laboratory/Lawrence Radiation Laboratory Cratering Symposium, Washington, D.C., part 2: University of California, Livermore, Report UCRL-6438, Paper N, 23 p. (Report prepared for the U.S. Atomic Energy Commission).

#### 1962

30. Shoemaker, E.M., 1962, Interpretation of lunar craters, in Kopal, Zdenek, ed., Physics and Astronomy of the Moon: London, Academic Press, p. 283-359.

31. Elston, D.P., Shoemaker, E.M., and Landis, E.R., 1962, Uncompander Front and Salt Anticline Region of Paradox Basin, Colorado and Utah: American Association of Petroleum Geologists Bulletin, v. 46, no. 10, p. 1857-1878.

32. Shoemaker, E.M., Roach, C.H., and Byers, F.M., Jr., 1962, Diatremes and uranium deposits in the Hopi Buttes, Arizona: Petrologic Studies, a volume to honor A. F. Buddington: Geological Society of America, p. 327-355.

33. Shoemaker, E.M., and Hackman, R.J., 1962, Stratigraphic basis for a lunar time scale, in Kopal, Zdenek and Mikhailov, Z.K., eds., The Moon -- Symposium no. 14 of the International Astronomical Union: London, Academic Press, p. 289-300.

34. Shoemaker, E.M., 1962, Exploration of the moon's surface: American Scientist, v. 50, no. 1, p. 99-130.

## 1963

35. Shoemaker, E.M., 1963, Impact mechanics at Meteor Crater, Arizona, in Middlehurst, B., and Kuiper, G.P., eds., The Moon, Meteorites, and Comets--The Solar System, v. 4: Chicago, University of Chicago Press, p. 301-336.

36. Shoemaker, E.M., Hackman, R.J., and Eggleton, R.E., 1963, Interplanetary correlation of geologic time, in Advances in the Astronautical Sciences, v. 8: New York, Plenum Press, p. 70-89.

37. Shoemaker, E.M., Gault, D.E., Moore, H.J., and Lugn, R.V., 1963, Hypervelocity impact of steel into Coconino sandstone: American Journal of Science, v. 261, no. 7, p. 668-682.

38. Gault, D.E., Shoemaker, E.M., and Moore, H.J., 1963, Spray ejected from the lunar surface by meteoroid impact: National Aeronautics and Space Administration Technical Note D-1767, 39 p.

### 1964

39. Shoemaker, E.M., 1964, The Moon close up: National
Geographic, v. 126, no. 5, p. 690-707.
40. Shoemaker, E.M., 1964, The geology of the Moon: Scientific

American, v. 211, no. 6, p. 38-47.

### 1965

41. Shoemaker, E.M., 1965, Preliminary analysis of the fine structure of the lunar surface in Mare Cognitum, in Ranger VII, part 2, Experimenters' Analyses and Interpretations: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-700, p. 75-134.

42. Shoemaker, E.M., and others, 1965, Report of Geology Working Group, in National Aeronautics and Space Administration 1965 Summer Conference on Lunar Exploration and Science, Falmouth, Massachusetts, July 19-31: National Aeronautics and Space Administration Special Publication SP-88, p. 77-160.

## 1966

43. Rennilson, J.J., Dragg, J.L., Morris, E.C., Shoemaker, E.M., and Turkevich, E., 1966, Lunar surface topography, in Surveyor I Mission Report, part II: Scientific Data and Results, September 10, 1966: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1023, p. 7-44.

44. Shoemaker, E.M., 1966, When the irresistible force meets the immovable object: Engineering and Science, v. 29, no. 5, p. 11-15. 45. Shoemaker, E.M., 1966, Interpretation of the small craters of the Moon's surface revealed by Ranger VII: Transactions of the International Astronomical Union, General Assembly, Proceedings, 12, Hamburg, Germany, 1964, v. XIIB, p. 662-672.

46. Shoemaker, E.M., 1966, Preliminary analysis of the fine structure of the lunar surface in Mare Cognitum, in Hess, W.N., Menzel, D.H., and O'Keefe, J.A., eds., The Nature of the Lunar Surface: International Astronomical Union-National Aeronautics and Space Administration Symposium, Proceedings, 1965, John Hopkins Press, p. 23-78.

47. Shoemaker, E.M., 1966, Progress in the analysis of the fine structure and geology of the lunar surface from the Ranger VIII and IX photographs, in Ranger VIII and IX, part II: Experimenters' Analyses and Interpretations, March 15, 1966: Jet Propulsion Laboratory, California Institute of Technology, Report No. 32-800, p. 249-336.

48. Shoemaker, E.M., Batson, R.M., and Larson, K.B., 1966, An appreciation of the Luna 9 pictures: Astronautics and Aeronautics, May 1966, p. 40-50.

49. Shoemaker, E.M., with Jaffe, L.D., and others, 1966, Surveyor I: Preliminary results: Science, 152, no. 3730, p. 1737-1750; also published in Surveyor I: A preliminary report: National Aeronautics and Space Administration, Special Publication 126, Washington, D.C.

### 1967

50. Gault, D.E., Adams, J.B., Collins, R.M., Green, J., Kuiper, G.P., Masursky, Harold, O'Keefe, J.A., Phinney, R.A., and Shoemaker, E.M., 1967, Lunar theory and processes, in Surveyor V Mission Report, Part II: Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1246, p. 177-179; also published in National Aeronautics and Space Administration, Special Publication 163, Washington, D.C., p. 155-156.

51. Gault, D., Collins, R., Gold, T., Green, J., Kuiper, G.P.,

Masursky, Harold, O'Keefe, J., Phinney, R., and Shoemaker, E.M., 1967, Lunar theory and processes, in Surveyor III Mission Report, Part II. Scientific results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1177, p. 193-213, also published in Surveyor III: A preliminary report: National Aeronautics and Space Administration, Special Publication 146, Washington, D.C., p. 141-156. 52. Schmitt, H.H., Trask, N.J., and Shoemaker, E.M., 1967, Geologic map of the Copernicus quadrangle of the Moon: U.S. Geological Survey Map 1-515 (LAC-58).

53. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1967, Television observations from Surveyor III, in Surveyor III Mission Report, Part II, Scientific Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1177, p. 9-67; also published in National Aeronautics and Space Administration, Special Publication 146, p. 9-59.

54. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1967, Surveyor V: Television pictures: Science, v. 158, no. 3801, p. 642-652.

55. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1967, Television observations from Surveyor V, in Surveyor V Mission Report, Part II: Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1246, p. 7-42; also published in National Aeronautics and Space Administration Special Publication 163, p. 9-42.

### 1968

56. Gault, D.E., Adams, J.B., Collins, R.J., Kuiper, G.P., Masursky, Harold, O'Keefe, J.A., Phinney, R.A., and Shoemaker, E.M., 1968, Lunar theory and processes, in Surveyor VII Mission Report, Part II: Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1264, p. 267-313; also published in National Aeronautics and Space Administration Special Publication no. 173, p. 233-276.

57. Gault, D.E., Adams, J.B., Collins, R.J., Kuiper, G.P., Masursky, Harold, O'Keefe, J.A., Phinney, R.A., and Shoemaker, E.M., 1968, Lunar theory and processes, in Surveyor Project Final Report, Part II, Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1265, p. 389-405.

58. Gault, D.E., Adams, J.B., Collins, R.J., Kuiper, G.P., Masursky, Harold, O'Keefe, J.A. Phinney, R.A., and Shoemaker, E.M., 1968, Lunar theory and processes: Journal of Geophysical Research, v. 73, no. 12, p. 4115-4131.

59. Jaffe, L.D., Alley, C.O., Batterson, S.A., Christensen, E.M., Dwornik, S.E., Gault, D.E., Lucas, J.W., Muhleman, D.O., Norton, R.H., Scott, R.F., Shoemaker, E.M., Steinbacher, R.H., Sutton, G.H., and Turkevich, A.L., 1968, Principal science results from the Surveyor project, in Surveyor Project Final Report, Part II, Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1265, p. 15-19.

60. Jaffe, L.D., Alley, C.O., Batterson, S.A., Christenson, E.M., Dwornik, S.E., Gault, D.E., Lucas, J.W., Muhleman, D.O., Norton, R.H., Scott, R.F., Shoemaker, E.M., Steinbacher, R.H., Sutton, G.H., and Turkevich, A.L., 1968, Principal science results from Surveyor VII, in Surveyor VII Mission Report, Part II. Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1264, p. 5-7; also published in National Aeronautics and Space Administration Special Publication 173, p. 1-3.

61. Jaffe, L.D., Batterson, S.A., Brown, W.E., Jr., Christensen, E.M., Gault, D.E., Lucas, J.W., Norton, R.H., Scott, R.F., Shoemaker, E.M., Sutton, G.H., and Turkevich, A.L., 1968, Principal scientific results of the Surveyor 3 mission: Journal of Geophysical Research, v. 73, no. 12, p. 3983-3987.

62. Jaffe, L.D., Batterson, S.A., Brown, W.E. Jr., Christensen, E.M., Dwornik, S.E., Gault, D.E., Lucas, J.W., Norton, R.H., Scott, R.F., Shoemaker, E.M., Sutton, G.H., and Turkevich, A.L., 1968, Principal science results from Surveyor 5: Journal of Geophysical Research, v. 73, no. 22, p. 7165-7167.

63. Morris, E.C., Batson, R.M., Holt, H.E., Rennilson, J.J., Shoemaker, E.M. (Principal Investigator), and Whitaker, E.A., 1968, Television observations from Surveyor VI, in Surveyor VI Mission Report, Part II, Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1262, p. 9-45; also published in National Aeronautics and Space Administration Special Publication 166, p. 11-40.

64. O'Keefe, J.A., Adams, J.B., Gault, D.E., Green, J., Kuiper, G.P., Masursky, Harold, Phinney, R.A., and Shoemaker, E.M., 1968, Theory and processes relating to the lunar maria from the Surveyor experiments, in Surveyor VI Mission Report, Part II: Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1262, p. 171-176; also published in National Aeronautics and Space Administration Special Publication 166, p. 145-149.

65. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1968, Television observations from Surveyor III: Journal of Geophysical Research, v. 73, no. 12, p. 3989-4043.

66. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1968, Television observations from Surveyor VII, in Surveyor VII Mission Report, Part II, Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1264, p. 9-75; also published in National Aeronautics and Space Administration Special Publication 173, p. 13-81.

67. Shoemaker, E.M., Morris, E.C., Batson, R.M., Holt, H.E., Larson, K.B., Montgomery, D.R., Rennilson, J.J., and Whitaker, E.A., 1968, Television observations from Surveyor, in Surveyor Project Final Report, Part II: Science Results: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1265, p. 21-136; also published in National Aeronautics and Space Administration Special Publication 184, p. 351-367.

#### 1969

68. Gault, D.E. (Chairman), Adams, J.B., Collins, R.J., Gold, T., Kuiper, G.P., Masursky, Harold, O'Keefe, J.A., Phinney, R.A., and Shoemaker, E.M., 1969, Lunar theory and processes, in Surveyor Program Results: National Aeronautics and Space Administration Special Publication 184, p. 351-367.

69. Jaffe, L.D. (Chairman), Alley, C.O., Batterson, S.A., Christensen, E.M., Dwornik, Gault, D.E., Lucas, J.W., Muhleman, D.O., Norton, R.H., Scott, R.F., Shoemaker, E.M., Steinbacher, R.H., Sutton, G.H., and Turkevich, A.L., 1969, Principal scientific results from the Surveyor program, in Surveyor Program Results: National Aeronautics and Space Administration Special Publication 184, p. 13-17.

70. Phinney, R.A., O'Keefe, J.A., Adams, J.B., Gault, D.E., Kuiper, G.P., Masursky, Harold, Collins, R.J., Shoemaker, E.M., 1969, Implications of the Surveyor 7 results: Journal of Geophysical Research, v. 74, no. 25, p. 6053-6080.

71. Shoemaker, E.M., 1969, The lunar regolith, in Randall, C.A. Jr., ed., Extraterrestrial Matter: Conference at Argonne National Laboratory, Proceedings, March 7-8, 1968, Northern Illinois University Press, p. 93-136.

72. Shoemaker, E.M., 1969, Space--Where, now, and why?: Engineering and Science, v. 33, no. 1, p. 9-12.

73. Shoemaker, E.M., Bailey, N.G., Batson, R.M., Dahlem, D.H., Foss, T.H., Grolier, M.J., Goddard, E.N., Hait, M.H., Holt, H.E., Larson, K.B., Rennilson, J.J., Schaber, G.G., Schleicher, D.L., Schmitt, H.H., Sutton, R.L., Swann, G.A., Waters, A.C., and West, M.H., 1969, Geologic setting of the lunar samples returned by the Apollo 11 mission, in Apollo 11 Preliminary Science Report: National Aeronautics and Space Administration Special Publication 214, p. 41-83.

74. Shoemaker, E.M., Batson, R.M., Holt, H.E., Morris, E.C., Rennilson, J.J., and Whitaker, E.A., 1969, Observations of the lunar regolith and the Earth from the television camera on Surveyor 7: Journal of Geophysical Research, v. 74, no. 25, p. 6081-6119.

75. Shoemaker, E.M., and other members of the Lunar Sample Preliminary Examination Team, 1969, Preliminary examination of lunar samples from Apollo 11: Science, v. 165, no. 3899, p. 1211-1227.

### 1970

76. Shoemaker, E.M., Batson, R.M., Bean, A.L., Conrad, C., Dahlem, D.H., Goddard, E.N., Hait, M.H., Larson, K.B., Schaber, G.G., Schleicher, D.L., Sutton, R.L., Swann, G.A., and Waters, A.C., 1970, Preliminary geologic investigation of the Apollo 12 landing site, in Apollo 12, Preliminary Science Report: National Aeronautics and Space Administration Special Publication 235.

77. Shoemaker, E.M., Hait, M.H., Swann, G.A., Schleicher, D.L., Dahlem, D.H., Schaber, G.G., Sutton, R.L., 1970, Lunar regolith at Tranquility Base: Science, v. 167, no. 3918, p. 452-455.

78. Shoemaker, E.M., Batson, R.M., Bean, A.L., Conrad, C., Dahlem, D.H., Goddard, E.N., Hait, M.H., Larson, K.B., Schaber, G.G., Schleicher, D.L., Sutton, R.L., Swann, G.A., and Waters, A.C., 1970, Preliminary examination of lunar samples from Apollo 12: Science, v. 167, no. 3923, p. 1325-1339.

79. Shoemaker, E.M., Hait, M.H., Swann, G.A., Schleicher, D.L., Schaber, G.G., Sutton, R.L., Dahlem, D.H., Goddard, E.N., and Waters, A.C., 1970, Origin of the lunar regolith at Tranquility Base: Apollo 11 Lunar Science Conference, Proceedings, v. 3, Supplement 1, p. 2399-2412. 80. Shoemaker, E.M., and Morris, E.C., 1970, Physical characteristics of the lunar regolith determined from Surveyor television observations: Radio Science, v. 5, p. 129-155.

81. Shoemaker, E.M., and Morris, E.C., 1970, Surveyor Final Reports--Geology: Craters: Fragmental Debris; Fragmental Debris Physics: Icarus, v. 12, p. 167-212.

## 1971

82. Anderson, O.L., Burk, C.A., Cox, A.V., Drake, C.L., Goldsmith, J.R., Knopoff, L., Maxwell, J.C., Press, F., Shoemaker, E.M., van Andel, T., 1971, Geodynamics Project: Development of a U.S. Program: EOS, American Geophysical Union, Transactions, v. 52, no. 5, p. 396-405. 83. Shoemaker, E.M., 1971, Origin of fragmental debris on the lunar surface and the history of bombardment of the Moon: Instituto de Investigaciones Geologicas de la Diputacion Provincial, Universidad de Barcelona, v. 25, p. 27-56.

### 1972

84. Shoemaker, E.M., 1972, Geology of the Moon and Project Apollo (Published in Japanese): Gendai Sedai Hyakkajiten (World Now Encyclopedia), Ryuzi Mikuni, ed., p. 826-827.

85. Stuart-Alexander, D.E., Shoemaker, E.M., and Moore, H.J., 1972, Geologic map of the Mule Ear diatreme, San Juan County, Utah: U.S. Geological Survey Map I-674.

## 1974

86. Goetz, A.F.H., Billingsley, F.C., Elston, D.P., Lucchitta, Ivo, and Shoemaker, E.M., 1974, Geologic applications of ERTS images on the Colorado Plateau, Arizona, in Third Earth Resources Technology Satellite - 1 Symposium, v. I, Section A: National Aeronautics and Space Administration, Washington, D.C., p. 719-744.

85. Shoemaker, E.M., and Kieffer, S.W., 1974, Guidebook to the Geology of Meteor Crater: Prepared for the 37th Annual Meeting of the Meteoritical Society, August 4, 1974, 66 p.

### 1975

87. Goetz, A.F.H., Billingsley, F.C., Gillespie, A.R., Abrams, M.J., Squires, R.L., Shoemaker, E.M., Lucchitta, Ivo, and Elston, D.P., 1975, Application of ERTS images and image processing to regional geologic problems and geologic mapping in Northern Arizona: Jet Propulsion Laboratory, California Institute of Technology, Technical Report No. 32-1597, 188 p.

88. Shoemaker, E.M., and Stephens, H.G., 1975, First photographs of the Canyon Lands: Four Corners Geological Society of Guidebook, Field Conference, 8th, Canyonlands, p. 111-122.

89. Shoemaker, E.M., and Swann, G.A., Conveners, 1975, Continental drilling, report of the workshop on continental drilling: Shoemaker, E.M., ed., Carnegie Institution of Washington, 55 p.

## 1976

90. Helin, E.F., and Shoemaker, E.M., 1976, 1976 AA: Discovery of a minor planet: Astronomy, v. 4, p. 12-13.
91. Shoemaker, E.M., Helin, E.F., and Gillett, S.L., 1976, Populations of planet-crossing asteroids: Geologica Romana, v. 15, p. 487-489.

## 1977

92. Helin, E.F., and Shoemaker, E.M., 1977, Discovery of 1976 AA: Icarus, v. 31, p. 415-419.

93. Shoemaker, E.M., 1977, Astronomically observable craterforming projectiles, in Roddy, D.J., Pepin, R.O., and Merrill, R.B., eds., Impact and explosion cratering: Planetary and terrestrial implications: New York, Pergamon Press, p. 617-628.

94. Shoemaker, E.M., 1977, Why study impact craters?, in Roddy, D.J., Pepin, R.O, and Merrill, R.B., eds., Impact and explosion cratering: Planetary and Terrestrial Implications: New York, Pergamon Press, p. 1-10.

95. Shoemaker, E.M., and Helin, E.F., 1977, Populations of planet-crossing asteroids and the relationship of Apollo objects to mainbelt asteroids and comets, in Delsemme, A.H., ed., Comets, Asteroids, Meteorites: Interrelations, Evolution and Origins: University of Toledo, p. 297-300.

## 1978

96. Shoemaker, E.M., 1978, Search for near-Earth asteroids, in Arnold, J.R., and Duke, M.B., eds., Summer workshop on near-Earth resources: National Aeronautics and Space Administration Conference Publication 2031, p. 57-61.

97. Shoemaker, E.M., and Helin, E.F., 1978, Earth-approaching asteroids: populations, origin, and compositional types, in Morrison, D., and Wells, W.C., eds., Asteroids: An Exploration Assessment: National Aeronautics and Space Administration Conference Publication 2053, p. 161-176.

98. Shoemaker, E.M., and Helin, E.F., 1978, Earth-approaching asteroids as targets for exploration, in Morrison, D., Wells, W.C., eds.: National Aeronautics and Space Administration Conference Publication 2053, p. 245-256.

99. Shoemaker, E.M., Squires, R.L., and Abrams, M.J., 1978, The Bright Angel and Mesa Butte fault system of northern Arizona, in Geology of Northern Arizona: Geological Society of America, Rocky Mountain Society Meeting, Flagstaff, Arizona, p. 355-391.

## 1979

Shoemaker, E.M., and Smith, B.A., 1979, Dynamics of volcanic 100. plumes on Io: Nature, v. 280, p. 743-746. 101. Helin, E.F., and Shoemaker, E.M., 1979, Palomar planet-crossing asteroid survey 1973-1978: Icarus, v. 40 p. 321-328. Shoemaker, E.M., and Kieffer, S.W., 1979, Guidebook to the 102. geology of Meteor Crater, Arizona (revised): Center for Meteorite Studies, Publication, No. 17, Arizona State University, Tempe, Arizona, 66 p. 103. Shoemaker, E.M., Squires, R.L., and Abrams, M.J., 1979, Bright Angel and Mesa Butte fault systems of northern Arizona: Geological Society of America Memoir 152, p. 341-367. 104. Shoemaker, E.M., Williams, J.G., Helin, E.F., and Wolfe, R.F., 1979, Earth-crossing asteroids: Orbital classes, collision rates with Earth and origin, in Gehrels, T., ed., Asteroids: University of Arizona Press, p. 253-282. 105. Smith, B.A., Shoemaker, E.M., Kieffer, S.W., and Cook, A.F. II, 1979, The role of SO2 in volcanism on Io: Nature, v. 280, p. 738-743. 106. Smith, B.A., Soderblom, L.A., Beebe, R., Boyce, J., Briggs, G., Carr, M.H., Collins, S.A., Cook, A.F. II, Danielson, G.E., Davies, M.E., Hunt, G.E., Ingersoll, A., Johnson, T.V., Masursky, Harold, McCauley, J., Morrison, D., Owen, T., Sagan, C., Shoemaker, E.M., Strom, R., Suomi, V.E., and Ververka, J., 1979, The Galilean Satellites and Jupiter: Voyager 2 Imaging Science Results: Science, v. 206, p. 927-950.

107. Smith, B.A., Soderblom, L.A., Johnson, T.V., Ingersoll, A.P., Collins, S.A., Shoemaker, E.M., Hunt, G.E., Masursky, Harold, Carr, M.H., Davies, M.E., Cook, A.F. II, Boyce, J., Danielson, G.E., Owen, T., Sagan, C., Beebe, R.F., Ververka, J., Strom, R. G., McCauley, J. F., Morrison, D., Briggs, G.A., and Suomi, V.E., 1979, The Jupiter system through the eyes of Voyager I: Science, v. 204, p. 951-972.

### 1980

108. Purucker, M.E., Elston, D.P., and Shoemaker, E.M., 1980, Early acquisition of characteristic magnetization in red beds of the Moenkopi Formation (Triassic), Gray Mountain, Arizona: Journal of Geophysical Research, v. 85, no. B2, p. 997-1012.

#### 1981

109. Cook, A.F. II, and Shoemaker, E.M., Smith, B.A., Danielson, G.E., Johnson, T.V., and Synnott, S.P., 1981, Volcanic origin of the eruptive plumes on Io: Science, v. 211, no. 4489, p. 1419-1922.
110. Emiliani, C. Kraus, E.B., and Shoemaker, E.M., 1981, Sudden death at the end of the Mesozoic: Earth and Planetary Science Letters, v. 55, p. 317-334.

111. Shoemaker, E.M., 1981, The collision of solid bodies, in Beatty, J.K., O'Leary, B., and Chaikin, A., eds., The New Solar System: Sky Publishing Corporation, Cambridge, Massachusetts, p. 33-45.
112. Shoemaker, E.M., 1981, Lunar Geology, in Hanle, P., and Chamberlain, V. del., eds., Space Science Comes of Age: Perspectives in the History of the Space Sciences: National Air and Space Museum, Smithsonian Institution, p. 51-57.

113. Smith, B.A., Soderblom, L.A., Beebe, R., Boyce, J., Briggs, G., Bunker, A., Collins, S.A., Hansen, C.J., Johnson, T.V., Mitchell, J.L., Terrile, R.J., Carr, M., Cook A.F. II, Cuzzi, J., Pollack, J.B., Danielson, G.E., Ingersoll, A., Davies, M.E., Hunt, G.E., Masursky, Harold, Shoemaker, E.M., Morrison, D., Owen, T., Sagan, C., Ververka, J., Strom, R., and Suomi, V. E., 1981, Encounter with Saturn: Voyager 1 Imaging Science Results: Science, v. 212, no. 4491, p. 136-192.

## 1982

114. Passey, Q.R., and Shoemaker, E.M., 1982, Craters and basins on Ganymede and Callisto: Morphological indicators of crustal evolution, in Morrison, D., ed., The Satellites of Jupiter: University of Arizona Press, p. 379-434.

115. Shoemaker, E.M., Lucchitta, B.K., Plescia, J.B., Squyres, S.W., and Wilhelms, D.E., 1982, Geology of Ganymede, in Morrison, D., ed., The Satellites of Jupiter: University of Arizona Press, p. 435-520. 116. Shoemaker, E.M., and Wolfe, R.F., 1982, Cratering time scales for the Galilean satellites of Jupiter, in Morrison, D., ed., The Satellites of Jupiter: University of Arizona Press, p. 277-339. 117. Smith, B.A., Soderblom, L., Batson, R., Bridges, P., Inge, J., Masursky, Harold, Shoemaker, E., Beebe, R., Boyce, J., Briggs, G., Bunker, A., Collins, S.A., Hansen, C.J., Johnson, T.V., Mitchell, J.L., Terrile, R.J., Cook, A.F. II, Cuzzi, J., Pollack, J.B., Danielson, G.E., Ingersoll, A.P., Davies, M.E., Hunt, G.E., Morrison, D., Owen, T., Sagan, C., Veverka, J., Strom, R., Suomi, V.E., 1982, A new look at the Saturn system: The Voyager 2 images: Science, v. 215, p. 504-537. 118. Wetherill, G.W., and Shoemaker, E.M., 1982, Collision of astronomically observable bodies with the Earth, in Silver, L.T., and Schultz, T.H., eds., Geological Implications of Impacts of Large Asteroids and Comets on the Earth: Geological Society of America Special Paper 190, p. 1-13.

### 1983

Shoemaker, E.M., 1983, Asteroid and comet bombardment of the
 Earth: Annual Review of Earth and Planetary Sciences, v. 11, p. 461-494.
 Shoemaker, E.M., 1983, Response on receiving Arthur L. Day
 Medal: Geological Society of America Bulletin, v. 94, no. 3, p. 426-427.

## 1984

121. Morrison, D., Johnson, T.V., Shoemaker, E.M., Soderblom, L., Thomas, P., Veverka, J., and Smith, B.A., 1984, Satellites of Saturn: Geological Perspective, in Gehrels, T., and Matthews, M.S., eds., Saturn: University of Arizona Press, p. 609-639.

122. Shoemaker, E.M., 1984, Large body impacts through geologic time, in Holland, H.D., and Trendall, A.F., eds., Patterns of Change in Earth Evolution, Dahlem Konferenzen: Berlin Springer-Verlag, p.15-40.
123. Shoemaker, E.M., 1984, Response on receiving G. K. Gilbert Award: Geological Society of America Bulletin, v. 95, p. 1001-1002.
124. Shoemaker, E.M., 1984, Acceptance of the Barringer Award: Meteoritics, v. 19, p. 180-182.

### 1985

125. Berger, W.H., Eddy, J.A., and Shoemaker, E.M., 1985, Effects of extra terrestrial phenomena on the evolution of complex life on Earth, in Milne, D., Raup, D., Billingham, J., Niklaus, K., and Padian, K., eds. The Evolution of Complex and Higher Organisms: National Aeronautics and Space Administration SP-478, p. 111-143.

126. Carrier, G.F., Moran, W.J., Decker, R.W., Eardley, D.M., Friend, J.P., Jones, E.M., Katz, J.I., Keeny, S.M., Jr., Leovy, C.B., Longmire, C.L., McElroy, M.B., Press, W., Ruina, J.P., Shoemaker, E.M., Smith, L., Toon, O.B., and Turco, R.P., 1985, The effects on the atmosphere of a major nuclear exchange: Washington, D.C., National Academy Press, 193 p.

127. Shoemaker, E.M., 1985, Presentation of the G. K. Gilbert Award to George W. Wetherill: citation: Geological Society of America Bulletin, v. 96, p. 1207-1208.

128. Shoemaker, C.S., and Shoemaker, E.M., 1985, Recent discoveries of comets with the Palomar 46-cm Schmidt camera: International Comet Quarterly, v. 7, p. 3-7; also in Reports of Planetary Geology and Geophysics Program 1984: National Aeronautics and Space Administration Technical Memorandum 87563, p. 591-593.

129. Strom, R.G., and Shoemaker, E.M., 1985, Chronology of planetary surfaces, in Veverka, Joseph, ed., Planetary Geology in the 1980's: NASA Scientific and Technical Information Branch, Washington, D.C., p. 75-84.

130. Morgan, M.G., Banerjee, S., Brookins, D.G., Cohen, N., Domenico, P.A., Hirschfeld, R.C., James, H.L., Kulp, J.L., Neill, R.H., Shoemaker, E.M., Wiltshire, S., 1986, Scientific basis for risk assessment and management of uranium mill tailings: Washington, D.C., National Academy Press, 246 p. 131. Shoemaker, E.M., 1986, Presentation of the G. K. Gilbert Award to Walter Alvarez: citation: Geological Society of America Bulletin, v. 97, p. 1406-1407. Shoemaker, E.M., and Wolfe, R.F., 1986, Mass extinctions, 132. crater ages, and comet showers, in Smoluchowski, R., Bahcall, J.N., and Matthews, M., eds., The Galaxy and the Solar System: Tucson, University of Arizona Press, p. 338-386. Smith, B.A., Soderblom, L.A., Beebe, R., Bliss, D., Boyce, 133. J.M., Brahic, A., Briggs, G.A., Brown, R.H., Collins, S.A., Cook, A.F., II, Croft, S.K., Cuzzi, J.N., Danielson, G.E., Davies, M.E., Dowling, T.E., Godfrey, D., Hansen, C.J., Harris, C., Hunt, G.E., Ingersoll, A.P., Johnson, T.V., Krauss, R.J., Masursky, H., Morrison, O., Owen, T., Plescia, J.B., Pollack, J.B., Porco, C.C., Rayes, K., Sagan, C., Shoemaker, E.M., Sromovsky, L. A., Stoker, C., Strom, R.G., Suomi, V.E., Synnott, S.P., Terrile, R. J., Thomas, P., Thompson, W. R., and Veverka, J., 1986, Voyager 2 in the Uranian system: Imaging Science Results: Science, v. 233, p. 43-64. Tanaka, K.L., Shoemaker, E.M., Ulrich, G.E., and Wolfe, E.W., 134. 1986, Migration of volcanism in the San Francisco volcanic field, Arizona: Geological Society of America Bulletin, v. 97, no. 2, p. 129-

### 1987

141.

Hut, P., Alvarez, W., Elder, W.P., Hanson, T., Kauffman,
E.G., Keller, G., Shoemaker, E.M., and Weissman, P.R., 1987, Comet
showers as a cause of mass extinctions: Nature, v. 329, p. 118-126.
136. Keller, G., D'Hondt, S.L., Orth, C.J., Gilmore, J.S., Oliver,
P.Q., Shoemaker, E.M., and Molina, E., 1987, Late Eocene impact
microspherules: stratigraphy, age, and geochemistry: Meteoritics, v. 22,
p. 25-60.

137. Schaber, G.G., Shoemaker, E.M., and Kozak, R.C., 1987, The surface age of Venus: Use of the terrestrial cratering record: Solar System Research, v. 21, p. 89-94.

138. Salyards, S.L., and Shoemaker, E.M., 1987, Landslide and debris-flow deposits in the Thumb Member of the Miocene Horse Spring Formation on the east side of Frenchman Mountain, Nevada: A measure of basin-range extension: Geological Society of America Centennial Field Guide--Cordilleran Section, p. 49-51.

139. Shoemaker, E.M., 1987, Meteor Crater, Arizona: Geological Society of America Centennial Field Guide--Rocky Mountain Section, p. 399-404.

140. Shoemaker, E.M., Pillmore, C.L., and Peacock, E.W., 1987, Remanent magnetization of rocks of latest Cretaceous and earliest Tertiary age from drill core at York Canyon, New Mexico: Geological Society of America Special Paper 190, p. 131-150.

141. Stephens, H.G., and Shoemaker, E.M., 1987, In the footsteps of John Wesley Powell: An album of comparative photographs of the Green and Colorado Rivers, 1871-72 and 1968: Boulder, Colorado, Johnson Books,

### 1986

286 p.

### 1988

142. Shoemaker, E.M., 1988, A note about the illustrations, in Cooley, John, The Great Unknown: The Journals of the Historic First Expedition Down the Colorado River: Flagstaff, Arizona, Northland Publishing, p. ix-x.

### 1989

143. Alvarez, Walter, Hansen, Thor, Hut, Piet, Kauffman, E.G., and Shoemaker, E.M., 1989, Uniformitarinism and the response of Earth scientists to the theory of impact crises, in Clube, S.V.M., ed., Catastrophes and Evolution: Astronomical Foundations, Cambridge, England, Cambridge University Press, p. 13-24.

144. Shoemaker, E.M., 1989, Presentation of the G.K. Gilbert Award to Don Edward Wilhelms: Citation: Geological Society of America Bulletin, v. 101, p. 1103-1004.

145. Shoemaker, E.M., Shoemaker, C.S., Wolfe, R.F., Trojan asteroids: Populations, dynamical structure and origin of the L4 and L5 swarms, in Binzel, R.P. and Matthews, M.S., eds. Asteroids II: Tucson, Arizona, University of Arizona Press, p. 487-523.

146. Smith, B.A., Soderblom, L.A., Banfield, D., Barnet, C., Basilevksy, A.T., Beebe, R., Bollinger, K., Boyce, J.M., Brahic, A., Briggs, G.A., Brown, R.H., Chyba, C., Collins, S.A., Colvin, T., Cook II, A.F., Crisp, D., Croft, S.K., Cruikshank, D., Cuzzi, J.N., Danielson, G.E., Davies, M. E., DeJong, E., Dones, L., Godfrey, D., Goguen, J., Grenier, I., Haemmerle, V.R., Hammel, H., Hansen, C.J., Helfenstein, C.P., Howell, C., Hunt, G.E., Ingersoll, A.P., Janes, D.M., Johnson, T.V., Kargel, J., Kirk, R., Kuehn, D.I., Limaye, S., Masursky, Harold, McEwen, A., Morrison, D., Owen, T., Owen, W., Pollack, J.B., Porco, C.C., Rages, K., Rudy, D., Sagan, C., Schwartz, J., Shoemaker, E.M., Showalter, M., Sicardy, B., Simonelli, D., Spencer, J., Sromovsky, L.A., Stoker, C., Strom, R.G., Suomi, V.E., Synott, S.P., Terrile, R.J., Thomas, P., Thompson, W.R., Verbiscer, A., and Veverka, J., 1989, Voyager 2 at Neptune: Imaging Science results: Science, v. 246, p. 1422-1449.

### 1990

147. Arvidson, R.E., Grimm, R.E., Phillips, R.J., Schaber, G.G., and Shoemaker, E.M., 1990, On the nature and rate of resurfacing of Venus: Geophysical Research Letters, v. 17, p. 1385-1388. Ostro, S.J., and Shoemaker, E.M., 1990, The extraordinary 148. radar echoes from Europa, Ganymede, and Callisto: A Geological Perspective: Icarus, v. 85, p. 335-345. Shoemaker, E.M., and Shoemaker, C.S., 1990, The collision of 149. solid bodies, in Beatty, J.K., and Chaikin, Andrew, eds., The New Solar System: Cambridge, Mass., Sky Publishing Corporation, p. 259-274. 150. Shoemaker, E.M., Wolfe, R.F., and Shoemaker, C.S., 1990, Asteroid and comet flux in the neighborhood of the Earth, in Sharpton, V.L., and Ward, P.D., eds., Global Catastrophes in Earth History; An Interdisciplinary Conference on Impacts, Volcanism, and Mass Mortality: Geological Society of America Special Paper 247, p. 155-170. Soderblom, L.A., Kieffer, S.W., Becker, T.L., Brown, R.H., 151. Cook, A.F., II, Hansen, C.J., Johnson, T.V., Kirk, R.L., and Shoemaker, E.M., 1990, Triton's geyser-like plumes: Discovery and basic

characterization: Science, v. 250, p. 410-415. 152. Tanaka, K.L., Onstott, T.C., and Shoemaker, E.M., 1990, Magnetostratigraphy of the San Francisco Volcanic Field, Arizona: U.S. Geological Survey Bulletin 1929, 35 p.

### 1991

Nishizumi, K., Kohl, C.P., Shoemaker, E.M., Arnold, J.R.,
Klein, J., Fink, D., and Middleton, R., 1991, In situ 10Be-26Al exposure ages at Meteor Crater, Arizona: Geochimica et Cosmochimica Acta. v. 55, p. 2699-2703.
Shoemaker, E.M., 1991, Barringer Medal Citation for Richard A.F. Grieve: Meteoritics, v. 26, p. 71.

### 1993

155. Nozette, Stewart, and Shoemaker, E.M., 1993, Back to the Moon, on to an asteroid: the Clementine mission: The Planetary Report, v. 13, p. 10-15.

156. Shoemaker, E.M., 1993, Presentation of the Day Medal to Susan Werner Kieffer (Citation): GSA Today, March 1993, p. 62.

157. Steiner, M.B., Morales, Michael, and Shoemaker, E.M., 1993, Magnetostratigraphic, biostratigraphic, and lithologic correlations in Triassic strata of the western United States: Applications of Paleomagnetism to Sedimentary Geology, SEPM Spec. Pub. No. 49, p. 41-57.

### 1994

Anderson, R.R., Hartung, J.B., Witzke, B.J., Shoemaker, E.M., 158. and Roddy, D.J., 1994, Preliminary results of the U.S. Geological Survey-Iowa Department of Natural Resources Geological Survey Bureau Manson Core Drilling Project, in Dressler, B.O., Grieve, R.A.F., and Sharpton, V.L., eds., Large Meteorite Impacts and Planetary Evolution: Geological Society of America Special Paper 293, p. 237-247. Carusi, A., Gehrels, T., Helin, E.F., Marsden, B.G., Russell, 159. K.S., Shoemaker, C.S., Shoemaker, E.M., and Steel, D.I., 1994, Near-Earth Objects: Present Search Programs, in Gehrels, T., ed., Hazards Due to Comet and Asteroids, The University of Arizona Press, p. 127-147. 160. Grieve, Richard A.F., and Shoemaker, Eugene M., 1994, The Record of Past Impacts on Earth, in Gehrels, T., ed., Hazards Due to Comets and Asteroids, The University of Arizona Press, p. 417-462. Nozette, Stewart, Rustan, P., Pleasance, L.P., Horan, D.M., 161. Regeon, P., Shoemaker, E.M., Spudis, P.D., Acton, C.H., Baker, D.N., Blamont, J.E., Buratti, B.J., Corson, M.P., Davies, M.E., Duxbury, T.C., Eliason, E.M., Jakosky, B.M., Kordas, J.F., Lewis, I.T., Lichtenberg, C.L., Lucey, P.G., Malaret, E., Massie, M.A., Resnick, J.H., Rollins, C.J., Park, H.S., McEwen, A.S., Priest, R.E., Pieters, C.M., Reisse, R.A., Robinson, M.S., Smith, D.E., Sorenson, T.C., Vorder Breugge, R.W., and Zuber, M.T., 1994, The Clementine Mission to the Moon, Science, December 16, 1994, v. 266, p. 1835-1839. 162. Nozette, Stewart, and Shoemaker, Eugene M., 1994, Clementine Goes Exploring: Sky & Telescope, April 1994, p. 38-39. Plescia, J.B., Shoemaker, E.M., and Shoemaker, C.S., 1994, 163. Gravity survey of the Mount Toondina impact structure, South Australia: Journal of Geophysical Research, v. 99, p. 13,167-13,179. 164. Rabinowitz, David, Bowell, Edward, Shoemaker, Eugene, and Muinonen, Karri, 1994, The Population of Earth-Crossing Asteroids, in

Gehrels, T., ed., Hazards Due to Comets and Asteroids, The University of Arizona Press, p. 285-312. Shoemaker, E.M., Robinson, M.S., and Eliason, E.M., 1994, The 165. South Pole Region of the Moon as Seen by Clementine, Science, December 16, 1994, v. 266, p. 1851-1854. Shoemaker, Eugene, Shoemaker, Carolyn, and Levy, David, 1994, 166. Discovering Comet Shoemaker-Levy 9, in Once in a Thousand Lifetimes: A quide to the collision of Comet Shoemaker-Levy 9 with Jupiter, Pasadena, California, The Planetary Society, p. 2-3. Shoemaker, Eugene M., Weissman, Paul R., and Shoemaker, 167. Carolyn S., 1994, The Flux of Periodic Comets Near Earth, in Gehrels, T., ed., Hazards Due to Comets and Asteroids, The University of Arizona Press, p. 313-335. Steiner, M.B., Lucas, S.G., and Shoemaker, E.M., 1994, 168. Correlation and Age of the Upper Jurassic Morrison Formation From Magnetostratigraphic Analysis, in Mario V. Caputo, James A. Peterson and Karen J. Franczyk, eds., Mesozoic Systems of the Rocky Mountain Region, USA, Denver, Colorado, Society for Sedimentary Geology, Rocky Mountain Section, p. 315-330. Weaver, H.A., Feldman, P.D., A'Hearn, M.F., Arpigny, C., 169. Brown, R.A., Helin, E.F., Levy, D.H., Marsden, B.G., Meech, K.J., Larson, S.M., Noll, K.S., Scotti, J.V., Sekanina, Z., Shoemaker, C.S., Shoemaker, E.M., Smith, T.E., Storrs, A.D., Yeomans, D.K., and Zellner, B., 1994, Hubble Space Telescope Observations of Comet P/Shoemaker-Levy 9 (1993e), Science, v. 263, p. 787-791.

## 1995

170. Bevan, A.W.R., Shoemaker, E.M., and Shoemaker, C.S., 1995, Metallography and thermo-mechanical treatment of the Veevers (IIAB) crater-forming iron meteorite, Records of the Western Australian Museum, v. 17, p. 51-59. 171. Huntoon, P.W. and Shoemaker, E.M., 1995, Roberts Rift, Canyonlands, Utah, A natural hydraulic fracture caused by comet or asteroid impact: Ground Water, v. 33, p. 561-569. 172. Levy, D.H., Shoemaker, E.M., and Shoemaker, C.S., 1995, Comet Shoemaker-Levy 9 Meets Juipter: Scientific American, v. 273, p. 69-75. 173. Shoemaker, E.M., 1995, Comet Shoemaker-Levy 9 at Jupiter: Geophysical Research Letters, v. 22, no. 12, p. 1555-1556. Shoemaker, Gene and Carolyn, 1995, Foreword for The Great 174. Comet Crash: The impact of Comet Shoemaker-Levy 9 on Jupiter, eds. John R. Spencer and Jacqueline Mitton, Cambridge University Press, p. vii-ix. 175. Shoemaker, C.S., and Shoemaker, E.M., 1995, A Comet Like No Other, in The Great Comet Crash: The impact of Comet Shoemaker-Levy 9 on Jupiter, eds. John R. Spencer and Jacqueline Mitton, Cambridge University Press, p. 7-12. 176. Shoemaker, E.M., Hassig, P.J., and Roddy, D.J., 1995, Numerical simulations of the Shoemaker-Levy 9 impact plumes and clouds: A progress report: Geophysical Research Letters, v. 22, p. 1825-1828. 177. Shoemaker, E.M., Boyarchuk, A.A., Canavan, G., Coradini, M., Darrah, J., Harris, A.J., Morrison, D., Mumma, M.J., Rabinowitz, D.L., Rikhova, R., Chapman, C.R., Marsden, B.G., Ostro, S.J., Worden, S.P., Yeomans, D.K., 1995, Report of the Near-Earth Object Survey Working Group, NASA Solar System Exploration Division, 57 p. 178. Stern, S.A., Slater, D.C., Gibson, W., Reitsema, H.J.,

Delamere, A., Jennings, D.E., Reuter, D.C., Clarke, J.T., Porco, C.C., Shoemaker, E.M., and Spencer, J.R., 1995, The Highly Integrated Pluto Payload System (HIPPS): A Sciencecraft Instrument for the Pluto Mission: EUV, X-Ray, and Gamma-Ray Instrumentation for Astronomy VI, SPIE-The International Society for Optical Engineering Proceedings, July 12-14, 1995, San Diego, California, v. 2518, p. 39-58.

179. Weaver, H.A., A'Hearn, M.F., Arpigny, C., Boice, D.C., Feldman, P.D., Larson, S.M., Lamy, P., Levy, D.H., Marsden, B.G., Meech, K.J., Noll, K.S., Scotti, J.V., Sekanina, Z., Shoemaker, C.S., Shoemaker, E.M., Smith, T.E., Stern, S.A., Storrs, A.D., Trauger, J.T., Yeomans, D.K., and Zellner, B., 1995, The Hubble Space Telescope (HST) Observing Campaign on Comet Shoemaker-Levy 9, Science, v. 267, p. 1282-1288.

## 1996

180. Brandt, J.C., A'Hearn, M.F., Randall, C.E., Schleicher, D.G., Shoemaker, E.M., and Stewart, A.I.F., 1996, Small comets (SCs) (Rettig, T.W. and Hahn, J.M., eds.): An unstudied population in the solary system inventory: Completing the Inventory of the Solar System ASP Conference Series, v. 107, p. 289-297.

181. Nozette, S., Lichtenberg, C.L., Spudis, P. Bonner, R., Ort, W., Marlaret, E., Robinson, M., and Shoemaker, E.M., 1996, The Clementine Bistatic Radar Experiment: Science, v. 274, p. 1495-1498.

182. Shoemaker, E.M., 1996, Citation of David J. Stevenson for the Whipple Award: EOS, v. 7, p. 84-85.

183. Shoemaker, E.M., 1996, Citation of Baerbel Koesters Lucchitta for the G.K. Gilbert Award: GSA Today, v. 6, no. 3, p. 30-31. 184. Shoemaker, Eugene M. and Shoemaker, Carolyn S., 1996, The Proterozoic impact record of Australia: AGSO Journal of Australian Geology and Geophysics, v. 16, no. 4, p. 379-398.

185. Steiner, M.B., and Shoemaker, E.M., 1996, A hypothesized Manson impact tsunami: Paleomagnetic and stratigraphic evidence in the Crow Creek Member, Pierre Shale: Geological Society of America Special Paper 302, 1996, p. 419-432.

### 1997

Levison, H.F., Shoemaker, E.M., and Shoemaker, C.S., 1997, 186. Dynamical evolution of Jupiter's Trojan asteroids: Nature, v. 385, p. 42-44. 187. McEwen, A.S., Moore, J.M., and Shoemaker, E.M., 1997, The Phanerozoic impact cratering rate: Evidence from the farside of the Moon: Journal of Geophysical Research, v. 102, p. 9231-9242. 188. Shoemaker, E.M., 1997, Response on receiving the Bowie Medal: EOS, v. 78, p. 53. 189. Shoemaker, E.M., 1997. Response on receiving the American Association of Petroleum Geologists Special Award: Bulletin of America, Association of Petroleum Geologists, v. 81, p. 849. 190. Wynn, J.C. and Shoemaker, E.M., 1997. Secrets of the Wabar Craters: Sky and Telescope, v. 94, no. 5, p. 44-48. 191. Kriens, B.J., K.E. Herkenhoff and Shoemaker, E.M., 1997. Structure and Kinematics of a Complex Impact Crater, Upheavel dome, Southeast Utah: Brigham Young University Geologic Studies 42, Part II, GSA Guidebook, 1997, p. 19.

192. Wynn, J.C. and Shoemaker, E.M., 1998, The Day the Sands Caught Fire: Scientific American, Nov. 1998, p. 65-71.
193. Shoemaker, E.M., 1998, Impact cratering through geologic time: J. Roy. Astron. Soc. Canada, Ruth Northcott Lecture, v. 92, p. 297-309.
194. Farley, K.A., Montanari, A., Shoemaker, E.M. and Shoemaker, C.S., 1998, Geochemical evidence for a comet shower in the Late Eocene: Science, May 22, 1998, v. 280, p. 1250-1253.
195. Shoemaker, E.M., 1998, Long-term variations in the impact cratering rate on Earth in Grady, M.M., Hutchison, R., McCall, G.J.H., and Rothery, D.A., eds., Meteorites: Flux with Time and Impact Effects, Geol. Soc.

## London Spec. Pub. No. 140, p. 6-10.

### 1999

196. Shoemaker, E.M. and Shoemaker, C.S., 1999, The role of collisions: in Beatty, J.K., Petersen, C.C., and Chaikin, Andrew, eds., The New Solar System: Cambridge, MA, Sky Publishing Corp., p.69-85.
197. Shoemaker, E.M. and Uhlherr, H.R., 1999, Stratigraphic relations of australites in the Port Campbell Embayment, Victoria: Meteoritics and Planet. Sci., v. 34, p. 369-384.
198. Kriens, B.J., Shoemaker, E.M., and Herkenhoff, K.E., 1999, Geology of the Upheaval Dome Impact Structure, Southeast Utah: Jour. Geophys. Res., v.104, p. 18,867-18,887.

### Abstracts

1. Shoemaker, E.M., 1951, Internal structure of the Sinbad Valley-Fisher Valley salt anticline, Colorado and Utah (abs.): Geological Society of America Bulletin, v. 62, no. 12, pt. 2, p. 1478.

2. Shoemaker, E.M., 1953, Collapse origin of the diatremes of the Navajo-Hopi reservations (abs.): Geological Society of America Bulletin, v. 64, no. 12, pt. 2, p. 1514.

3. Shoemaker, E.M., and Newman, W.L., 1953, Ute Mountains, a laccolithic feature in southwestern Colorado (abs.): Geological Society of America Bulletin, v. 64, no. 12, pt. 2, p. 1555.

4. Shoemaker, E.M., 1956, Unusual folds in Moenkopi Formation around Fisher Valley, Utah (abs.): Geological Society of America Bulletin, v. 67, no. 12, pt. 2, p. 18.

5. Shoemaker, E.M., Newman, W.L., and Miesch, A.T., 1956, Sources of the elements in the sandstone-type uranium deposits of the Colorado Plateau (abs.): International Geological Congress, 20th, Mexico City, 1956, Resumenes de los trabajos presentados, p. 102-103.

6. Shoemaker, E.M., 1957, Primary structures of maar rims and their bearing on the origin of Kilbourne Hole and Zuni Salt Lake, New Mexico (abs.): Geological Society of America Bulletin, v. 68, no. 12, pt. 2, p. 1846.

7. Miesch, A.T., Shoemaker, E.M., Newman, W.L., and Finch, W.I., 1958, Chemical composition as a guide to the size of sandstone-type uranium deposits in the Morrison Formation on the Colorado Plateau

#### 1998

(abs.): Economic Geology, v. 53, no. 7, p. 923-924. Miesch, A.T., Shoemaker, E.M., Newman, W.L., and Finch, W.I., 8. 1958, Chemical composition as a guide to the size of sandstone-type uranium deposits in the Morrison Formation on the Colorado Plateau (abs.): Geological Society of America Bulletin, v. 69, no. 12, pt. 2, p. 1613. Shoemaker, E.M., 1959, Structure and Quaternary stratigraphy 9. of Meteor Crater, Arizona, in the light of shock-wave mechanics (abs.): Geological Society of America Bulletin, v. 70, no. 12, pt. 2, p. 1748. Shoemaker, E.M., and Chao, E.C.T., 1960, Origin of the Ries 10. Basin, Bavaria, Germany (abs.): Geological Society of America Bulletin, v. 71, no. 12, pt. 2, p. 2111-2112. 11. Shoemaker, E.M., and Hackman, R.J., 1960, Stratigraphic basis for a lunar time scale (abs.): Geological Society of America Bulletin, v. 71, no. 12, pt. 2, p. 2112. Shoemaker, E.M., 1961, Interplanetary correlation of geologic 12. time (abs.): American Association of Petroleum Geologists Bulletin, v. 45, no. 1, p. 130. Eggleton, R.E., and Shoemaker, E.M., 1962, Breccia at Sierra 13. Madera, Texas (abs), in Abstracts for 1961: Geological Society of America Special Paper 68, p. 169-170. Chao, E.C.T., Shoemaker, E.M., and Madsen, B.M., 1962, First 14. natural occurrence of coesite from Meteor Crater, Arizona (abs.), in Abstracts for 1961: Geological Society of America Special Paper no. 68, p. 225. Shoemaker, E.M., 1962, Sampling the moon through 15. Kordylewski's clouds: Journal of Geophysical Research, v. 67, no. 4, p. 1656-1657. 16. Gault, D.E., Shoemaker, E.M., and Moore, H.J., 1962, The flux and distribution of fragments ejected from the lunar surface by meteoroid impact (abs.): EOS, American Geophysical Union, Transactions, v. 43, no. 4, p. 465. 17. Shoemaker, E.M., and Elston, D.P., 1963, Structure and history of the salt anticlines of the Paradox Basin, Colorado and Utah (abs.) in Abstracts for 1962: Geological Society of America Special Paper 73, p. 283-284. Shoemaker, E.M., 1963, Astrogeology, a new horizon (abs.), in 18. Abstracts for 1962: Geological Society of America Special Paper 72, p. 241. 19. Shoemaker, E.M., 1966, Structure of the Jangle U and Teapot Ess nuclear explosion craters (abs.), in Conference on Shock Metamorphism of Natural Materials, April 14-16, 1966, Goddard Space Flight Center, Greenbelt, Maryland, p. 22. Shoemaker, E.M., and Lowery, C.J., 1966, Airwaves associated 20. with large fireballs and the frequency distribution of energy of large meteoroids: Meteoritics, Nov. 1966, v. 3, no. 2. 21. Shoemaker, E.M., and Stephens, H.G., 1969, The Green and Colorado River Canyons observed from the footsteps of Beaman and Hillers 97 years after Powell (abs.): Geological Society of America, Annual Meeting, 22nd, Rocky Mountain Section, Abstracts with Programs, 1969, pt. 5, p. 73. 22. Shoemaker, E.M., Lucchitta, Ivo, and Foley, M.G., 1971, Collapse of the Basin and Range Province and the Colorado River problem (abs.), in 2nd ARETS Symposium, Proceedings, University of Arizona, p.

196-198. 23. Shoemaker, E.M., 1971, Why explore the geology of Mars (abs.): Geological Society of America, Abstracts with Programs, v. 3, p. 703. 24. Shoemaker, E.M., Jackson, E.D., and Hait, M.H., 1971, Surficial and bedrock stratigraphy of the Apollo 12 landing site (abs.): Geological Society of America, Abstracts with Programs, v. 3, p. 703. Shoemaker, E.M., 1972, Cratering history and early evolution 25. of the Moon (ext. abs.), in Watkins, C., ed., Revised Abstract of Papers: Lunar Science Conference, 3rd, p. 696-698. 26. Helsley, C.E., and Shoemaker, E.M., 1973, Magnetostratigraphy of the Moenkopi Formation (abs.): Geological Society of America, Abstracts with Programs, v. 5, no. 7, p. 665-666. Purucker, M.E., and Shoemaker, E.M., 1973, Remarkable episode 27. of instability of the geomagnetic field in Triassic time (abs.): International Association of Geomagnetism and Aeronomy Bulletin, v. 34, p. 310-311. 28. Shoemaker, E.M., Elston, D.P., and Helsley, C.E., 1973, Depositional history of the Moenkopi Formation in light of its magnetostratigraphy (abs): Geological Society of America, Abstracts with Programs, v. 5, no. 7, p. 807-808. Shoemaker, E.M., Squires, R.L., and Abrams, M.J., 1973, The 29. Bright Angel and Mesa Butte fault systems of northern Arizona (abs.), in Annual Conference on Remote Sensing in Arid Lands, 4th Proceedings, University of Arizona, p. 158-159. Shoemaker, E.M., and Purucker, M.E., 1974, "Gray Mountain" 30. magnetozone in the Moenkopi Formation of Arizona and Utah (abs.): EOS, American Geophysical Union, Transactions, v. 56, no. 12, p. 1108-1109. Shoemaker, E.M., 1975, Late Cenozoic faulting and uplift of 31. the Colorado Plateau (abs.): Geological Society of America, Abstracts with Programs, v. 7, p. 1270. Shoemaker, E.M., and Helin, E.F., 1976, An Empirical test of 32. Opik's equation for probabilities of collision of small bodies with the planets (abs.): American Astronomical Society Bulletin, v. 8, p. 433. Shoemaker, E.M. and Helin, E.F., 1976, Systematic search for 33. planet-crossing asteroids and the estimation of impact rates on the terrestrial planets (ext. abs.), in Reports of Accomplishments of Planetology Programs, 1975-1976: National Aeronautics and Space Administration Technical Memorandum X-3364, p. 18-22. 34. Champion, D.E., and Shoemaker, E.M., 1977, Paleomagnetic evidence for episodic volcanism on the Snake River Plain (ext. abs.), in Greeley, R., and Black, David, eds., Abstracts for the Planetary Geology Field Conference on the Snake River Plain, Idaho: National Aeronautics and Space Administration Technical Memorandum TM-78436, p. 7-9. Helin, E.F., and Shoemaker, E.M., 1977, 1976 UA: Second 35. Asteroid with Orbit Smaller than Earth's (abs.): American Astronomical Society Bulletin, v. 9, p. 461. 36. Kellogg, J.N., and Shoemaker, E.M., 1977, Age determination of volcanic rocks by spatial frequency of lightning strikes in the San Francisco volcanic field, Arizona (abs.): EOS, American Geophysical Union, Transaction, v. 58, p. 376. Shoemaker, E.M., and Helin, E.F., 1977, Present impact 37. cratering rates on the terrestrial planets and the Moon (ext. abs.), in Reports of Planetary Geology Program, 1976-1977: National Aeronautics

and Space Administration Technical Memorandum X-3511, p. 74-77. Steiner, M.B., Shive, P.N., and Shoemaker, E.M., 1977, 38. Polarity of the magnetic field during the Upper and Middle Jurassic (abs.): EOS, American Geophysical Union, Transactions, v. 58, p. 376. Champion, D.E., Gromme, C.S., and Shoemaker, E.M., 1978, 39. Holocene geomagnetic secular variation recorded in basaltic lavas of the western United States (abs.): EOS, American Geophysical Union, Transactions, v. 59, p. 1060. Helin, E.F., Shoemaker, E.M., and Wolfe, R.F., 1978, Ra-40. Shalom: Third Member of the Aten class of earth-crossing asteroids (abs.): American Astronomical Society Bulletin, v. 10, p. 732. Shoemaker, E.M., 1978, Search for near-Earth asteroids 41. (abs.), in Arnold, J.R., and Duke, M.B., eds., Summer workshop on near-Earth resources: National Aeronautics and Space Administration Conference Publication 2031, p. 57-61. Shoemaker, E.M., and Helin, E.F., 1978, Near-Earth asteroids 42. as targets for exploration (ext. abs.), in Reports of Planetary Geology Program, 1977-1978: National Aeronautics and Space Administration Technical Memorandum 79729, p. 20-21. Shoemaker, E.M., Squires, R.L., and Abrams, M.J., 1978, The 43. Bright Angel and Mesa Butte fault system of northern Arizona, in Geology of Northern Arizona: Geological Society of America, Rocky Mountain Society Meeting, Flagstaff, Arizona, p. 355-391. Shoemaker, E.M., 1979, Geology and history of Ganymede and 44. Callisto (abs.): American Astronomical Society Bulletin, v. 11, p. 585. Shoemaker, E.M., 1979, Geology of Ganymede (ext. abs.): 45. National Aeronautics and Space Administration Technical Memorandum TM-80339, p. 373-374. Shoemaker, E.M., and Passey, Q.R., 1979, Tectonic history of 46. Ganymede (abs.): EOS, American Geophysical Union, Transactions, v. 60, p. 869. 47. Shoemaker, E.M., Williams, J.G., Helin, E.F., and Wolfe, R.F., 1979, Earth-crossing asteroids: Orbital classes, population, and fluctuation of population in late geologic time (ext. abs.): National Aeronautics and Space Administration Technical Memorandum TM-80339, p. 3-5. Passey, Q.R., and Shoemaker, E.M., 1980, Global distribution 48. of craters and multiring structures on Callisto (abs.): American Astronomical Society Bulletin, v. 12, p. 712. Passey, Q.R., Shoemaker, E.M., and McCauley, J.F., 1980, 49. Craters and basins on Ganymede and Callisto (abs.): International Astronomical Union Colloquium No. 57, Session 6, Paper 8. Plescia, J.B., Boyce, J.M., and Shoemaker, E.M., 1980, 50. Ganymede cratering I: The dark terrain (abs.): American Astronomical Society Bulletin, v. 12, p. 710. Plescia, J.B., Boyce, J.M., and Shoemaker, E.M., 1980, 51. Ganymede cratering II: The smooth and grooved terrains (abs.): American Astronomical Society Bulletin, v. 12, p. 711. Plescia, J.B., Shoemaker, E.M., and Boyce J.M., 1980, The 52. cratering of Ganymede I: The dark terrain (ext. abs.), in Reports of Planetary Geology Program-1980: National Aeronautics and Space Administration Technical Memorandum 82382, p. 55-59. Plescia, J.B., Shoemaker, E.M., and Boyce, J.M., 1980, The 53. cratering of Ganymede II: Grooved terrain, smooth and Gilgamesh (ext.

abs.), in Reports of Planetary Geology Program-1980: National Aeronautics and Space Administration Technical Memorandum 82385, p. 60-63. 54. Shoemaker, E.M., 1980, Geologic history of Ganymede (abs.), in International Astronomical Union Colloquium No. 57, Session 6, Paper 1. 55. Shoemaker, E.M., Bus. S.J., Williams, J.G., and Helin, E.F., 1980, Search for planet-crossing asteroids with the Palomar 122-cm Schmidt camera (abs.), in Reports of Planetary Geology Program, 1979-80: National Aeronautics and Space Administration Technical Memorandum 81776, p. 8-10. Shoemaker, E.M., Helin, E.F., Bus. S.J., and Passey, Q.R., 56. 1980, New planet-crossing asteroids, 1979, (ext. abs.), in Reports of Planetary Geology Program-1980: National Aeronautics and Space Administration Technical Memorandum 82385, p. 3-5. Shoemaker, E.M., and Wolfe, R.F., 1980, Comets and the 57. Galilean satellites (abs.): American Astronomical Society, Bulletin, v. 12, p. 712. 58. Wenrich-Verbeek, K.J., and Shoemaker, E.M., 1980, Uranium mineralization in Hopi Buttes, Arizona (abs.): American Association of Petroleum Geologists, Book of Abstracts, 1980, American Association of Petroleum Geologists Annual Convention, p. 136-137. 59. Degewij, J., Shoemaker, E.M., Wolfe, R.F., 1981, Low activity comets in 1981-1982 (abs.): American Astronomical Society Bulletin, v. 13, p. 705. Passey, Q.R., and Shoemaker, E.M., 1981, Age of Callisto's 60. surface, regional variation of crater density and model ages of Callisto's crust (ext. abs.), in Lunar and Planetary Science XII, Lunar and Planetary Science Conference, March 16-20, 1981, p. 816-818. Passey, Q.R., Shoemaker, E.M., 1981, Ganymedian thermal 61. gradients from studies of crater relaxation (abs.): EOS, American Geophysical Union, Transactions, v. 62, p. 317. Shoemaker, E.M., 1981, Collision of asteroids and comets with 62. planets and satellites in late geologic time (abs.), in Papers presented to the Conference on Large Body Impacts and Terrestrial Evolution: Geological, Climatological, and Biological Implications, Lunar and Planetary Institute: National Academy of Sciences, Contribution No. 449, p. 8. Shoemaker, E.M., 1981, Crustal evolution of Callisto and 63. Ganymede (abs.): EOS, American Geophysical Union, Transactions, v. 62, p. 317. 64. Shoemaker, E.M., 1981, The icy satellites of Saturn (abs.): EOS, American Geophysical Union, Transactions, v. 62, p. 254. Shoemaker, E.M., 1981, Impact record of the planets and 65. satellites (abs.): Geological Society of America Annual Meeting, Abstracts with Programs, v. 13, p. 553. 66. Shoemaker, E.M., Shoemaker, C.S., Helin, E.F., Bus, S.J., and Wolfe, R.F., 1981, Survey for bright Mars-crossing asteroids (ext. abs): National Aeronautics and Space Administration Technical Memorandum 84211, Representatives of Planetary Geology Program, 1981, p. 17-19. 67. Shoemaker, E.M., and Wolfe, R.F., 1981, Evolution of the Saturnian satellites: The role of impact (ext. abs.), in Satellites of Saturn, Lunar and Planetary Science XII, Supplement A, p. 1-3. 68. Bus, S.J., Helin, E.F., Dunbar, R.S., and Shoemaker, E.M.,

Dawe, J., Barrow, J., Hartley, M., Morgan, D., Russell, K., and Savage, A., 1982, The United Kingdom - Caltech Asteroid Survey (ext. abs.), in Reports of Planetary Geology Program-1982: National Aeronautics and Space Administration Technical Memorandum 85127, p. 53-56.

69. Cook, A.F., Shoemaker, E.M., Soderblom, L.A., Mullins, K.F., and Fiedler, R., 1982, Volcanism in ice on Europa (abs.), in Reports of Planetary Geology Program-1982: National Aeronautics and Space Administration Technical Memorandum 85127, p. 415-416.

70. Gehrels, T., McMillan, R., Frecker, J., Roland, E., Stoll, C., Doose, L., Shoemaker, E., Nozette, S., Boesgaard, H., 1982, Progress report on the Spacewatch camera (abs.): American Astronomical Society Bulletin, v. 14, p. 728.

71. Passey, Q.R., and Shoemaker, E.M., 1982, Early thermal histories of Ganymede and Callisto (extended abs.): Lunar and Planetary Science XIII, p. 619-620.

72. Shoemaker, E.M., 1982, Bombardment of the Earth from late stages of accretion to modern times, (abs.): Geological Society of America, Abstracts with Programs 1982, New Orleans, Louisiana, v. 14, p. 616.

73. Andrews, R.S., and Shoemaker, E.M., 1983, Continental Scientific Drilling Program: An opportunity for coordinated research (abs.): Geological Society of America, Abstracts with Programs, 1983, Rocky Mountain Section, p. 434.

74. Shoemaker, E.M., 1983, Impacts and extinctions; a planetary perspective on evolutionary biology (abs.), in (Herschman, Arthur, ed.), National Meeting of the American Association of Science, Abstract Papers, 149th: AAAS Publication, 8302, p. 13-14.

75. Shoemaker, E.M., and Herkenhoff, K.E., 1983, Impact origin of Upheaval Dome, Utah (abs.): EOS, American Geophysical Union, Transactions, v. 64, p. 747; also in Reports of Planetary Geology Program-1983: National Aeronautics and Space Administration Technical Memorandum 86246, p. 93.

76. Shoemaker, E.M., Pillmore, C.L., Tshudy, R.H., and Orth, C.J., 1983, Characteristic magnetization of Cretaceous/Tertiary boundary claystone in Raton Basin is reversed (abs.): Geological Society of America, Abstracts with Program, 1983, Rocky Mountain Section, p. 309.

77. Wolfe, R.F., Degewij, J., Shoemaker, E.M., 1983, The perihelion brightness surge of short-period comets (abs.): American Astronomical Society Bulletin, v. 15, p. 807; also in Reports of Planetary Geology Program-1983: National Aeronautics and Space Administration Technical Memorandum 86246, p. 62.

78. Shoemaker, E.M., Bus, S.J., Dunbar, R.S., Helin, E.F., Dawe, J., Barrow, J., Hartley, M., Morgan, D., Russell, K., and Savage, A., 1984, Mars-crossing asteroids discovered in the UK-Caltech Asteroid Survey (abs.): American Astronomical Society Bulletin, v. 16, p. 691. 79. Shoemaker, E.M., and Herkenhoff, K.E., 1984, Upheaval Dome impact structure (abs.), in Lunar and Planetary Science XV, p. 778-779. 80. Shoemaker, E.M. and Shoemaker, C.S., 1984, Survey for Mars-crossing asteroids, 1983 (abs.), in Reports of Planetary Geology Program-1983: National Aeronautics and Space Administration Technical Memorandum 86246, p. 50.

81. Shoemaker, E.M., Steiner, M.B., Fassett, J.E., and Tschudy, R. H., 1984, Magnetostratigraphy of Upper Cretaceous rocks at Mesa Portales, New Mexico (abs.): Geological Society of America, Abstracts with Programs, Rocky Mountain Section, p 255. Shoemaker, E.M., and Wolfe, R.F., 1984, Evolution of the 82. Uranus-Neptune Planetesimal Swarm (extended abs.), in Lunar and Planetary Science XV, p. 780-781; also in Reports of Planetary Geology Program-1983: National Aeronautics and Space Administration Technical Memorandum 86246, p. 37. 83. Shoemaker, E.M., and Wolfe, R.F., 1984, Crater ages, comet showers, and the putative "Death Star" (abs.): Meteoritics, v. 19, p. 313. Tanaka, K.L., Ulrich, G.E., and Shoemaker, E.M., 1984, 84. Magnetostratigraphy of the San Francisco volcanic field, Arizona (abs.): Geological Society of America, Abstracts with Programs, Rocky Mountain Section, p. 257. Gillett, S.L., Kirschrink, J.L., Van Alstine, D.R., Lewis, 85. R.E., and Shoemaker, E.M., 1985, Paleomagnetism of upper Precambrian through Middle Cambrian rocks from the Nopah Range, SE California (abs.): EOS, v. 66, p. 876. Hut, P., Alvarez, W., Elder, W., Hansen, T.A., Keller, G., 86. Shoemaker, E. M., Weismman, P., 1985, Comet showers as possible causes of stepwise mass extinctions (abs.): EOS, v. 66, p. 813. Keller, G., D'Hondt, S., Onstott, T., Orth, C.J., Gilmore, 87. G.S., Shoemaker, E.M., and Keigwin, L.D., Jr., 1985, Multiple late Eocene impact events: stratigraphic, isotopic and geochemical data: Geological Society of America, Abstracts with Programs, 1985, p. 626. Shoemaker, E.M., and Shoemaker, C.S., 1985, Impact structures 88. of Western Australia (abs.): Meteoritics, v. 20, p. 754-756; also in Reports of Planetary Geology and Geophysics Program 1985: National Aeronautics and Space Administration Technical Memorandum 88383, p. 482-484. Bus, S.J., Bowell, E., Shoemaker, E.M., and Kowal, C.T., 89. 1986, Photographic recovery of UCAS asteroids (abs.): American Astronomical Society Bulletin, v. 18, p. 793. Harris, A.W., and Shoemaker, E.M., 1986, Asteroid and comet 90. collision: response to the hazards (abs.): EOS, v. 67, p. 243. Shoemaker, E.M., 1986, Hazards of asteroid and comet 91. collision with Earth (abs.): EOS, v. 67, p. 243. Shoemaker, E.M., 1986, Satellites of Uranus (abs.): 92. Geological Society of America, Abstracts with Programs, 1986, p. 413. Shoemaker, E.M., 1986, Geologic history of the Uranian 93. satellites (abs.): Geological Society of America, Abstracts with Programs, 1986, p. 749. 94. Shoemaker, E.M., and Shoemaker, C.S., 1986, Connolly Basin, a probable eroded impact crater in Western Australia (extended abs.), in Lunar and Planetary Science XVII, p. 97-798. Shoemaker, E.M., Wolfe, R.F., and Shoemaker, C.S., 1986, 95. Extinct Jupiter-family comets and cratering rates on the galilean satellites (extended abs.), in Lunar and Planetary Science XVII, p. 799-800. Shoemaker, E.M., Wolfe, R.F., Bus, S.J., and Williams, J.G., 96. 1986, Proper elements and Mars-crossing depths of planet-crossing UCAS asteroids (extended abs.), in Reports of Planetary Geology and Geophysics Program 1985: National Aeronautics and Space Administration Technical Memorandum 88383, p. 18-21 97. Schaber, G.G., Shoemaker, E.M., and Kozak, R.C., 1987, Is the

Venusian surface really old? (extended abs.), in Lunar and Planetary Science XVIII, p. 874-875.

98. Schaber, G.G., Shoemaker, E.M., and Kozak, R.C., 1987, The surface age of Venus: Applying the terrestrial cratering rate (extended abs.), in Reports of Planetary Geology and Geophysics Program-1986: National Aeronautics and Space Administration Technical Memorandum 89810, p. 405-407.

99. Schaber, G.G., Shoemaker, E.M., and Wolfe, R.F., 1987, The geologically complex surface of Venus: Is it old or young? (abs.): Geological Society of America Abstracts with Programs, p. 831.

100. Shoemaker, E.M., and Ostro, S.J., 1987, Thermally annealed ejecta in icy regoliths: Source of the unusual radar echoes from Europa, Ganymede and Callisto (abs), in American Astronomical Society Bulletin, v. 19, p. 631.

101. Shoemaker, E.M., and Shoemaker, C.S., 1987, Meteorite craters of Western Australia (abs.): Geological Society of America Abstracts with Programs, p. 842-843.

102. Shoemaker, E.M., and Shoemaker, C.S., 1987, Observations on the magnitude-frequency distribution of Earth-crossing asteroids (extended abs.), in Reports of Planetary Geology and Geophysics Program-1986: National Aeronautics and Space Administration Technical Memorandum 89810, p. 72-74.

103. Shoemaker, E.M., and Wolfe, R.F., 1987, Crater production on Venus and Earth by asteroid and comet impact (extended abs.), in Lunar and Planetary Science XVIII, p. 918-919; also in Reports of Planetary Geology and Geophysics Program-1986: National Aeronautics and Space Administration Technical Memorandum 89810, p. 402-408.

104. Champion, D.E., Lanphere, M.A., and Shoemaker, E.M., 1988, Multiple polarity subchrons within the Brunhes and Matuyama polarity chrons (abs.): EOS, v. 19, p. 1168.

105. Roddy, D.J., Shoemaker, E.M., Shoemaker, C.S., and Roddy, J.K., 1988, Aerial photography and geologic studies of impact structures in Australia (extended abs.), in Lunar and Planetary Science XIX, p. 990-991.

106. Shoemaker, C.S., and Shoemaker, E.M., 1988, The Palomar asteroid and comet survey (PACS), 1982–1987 (extended abs.), in Lunar and Planetary Science XIX, p. 1077–1078; also in Reports of Planetary Geology and Geophysics Program, 1987: National Aeronautics and Space Administration Technical Memorandum 4041, p. 52–54.

107. Shoemaker, E.M., 1988, Solar system roulette: Asteroid strikes and comet showers (abs.): American Association for the Advancement of Science 1988 Annual Meeting Abstracts, p. 12.

108. Shoemaker, E.M., Roddy, D.J., Shoemaker, C.S., and Roddy, J.K., 1988, The Boxhole meteorite crater, Northern Territory, Australia (extended abs.), in Lunar and Planetary Science XIX, p. 1081-1082.

109. Shoemaker, E.M., and Shoemaker, C.S., 1988, Impact structures of Australia (1987) (extended abs.), in Lunar and Planetary Science XIX, p. 1079-1080; also in Reports of Planetary Geology and Geophysics Program, 1987: National Aeronautics and Space Administration Technical Memorandum 4041, p. 425-427.

110. Shoemaker, E.M., and Shoemaker, C.S., 1988, The Spider impact structure, Western Australia (abs.): Geological Society of America, 1988 Centennial Celebration, Abstracts with Programs, A 147.

111. Shoemaker, E.M., and Shoemaker, C.S., Wolfe, R.F., 1988,

Asteroid and comet, flux in the neighborhood of the Earth (extended abs.), in Global Catastrophes in Earth History: An interdisciplinary conference on impacts, volcanism, and mass mortality: Houston, Texas, Lunar and Planetary Institute, p. 174-176.

112. Nishiizumi, K., Kohl, C.P., Shoemaker, E.M., Arnold, J.R., Lal, D., Klein, J., Fink, D., and Middleton, R., 1989, In situ 10Be-26Al exposure ages at Meteor Crater, Arizona (extended abs.), in Lunar and Planetary Science XX, p. 792-793.

113. Shoemaker, E.M., and Shoemaker, C.S., 1989, Geology of the Connolly Basin impact structure, Western Australia (extended abs.), in Lunar and Planetary Science XX, p. 1008-1009; also in Reports of Planetary Geology and Geophysics Program 1988: NASA Technical Memorandum 4130, p. 586-587.

114. Shoemaker, E.M., Shoemaker, C.S., and Plescia, J.B., 1989, Gravity investigation of the Connolly Basin impact structure, Western Australia (extended abs.), in Lunar and Planetary Science XX, p. 1010– 1011; also in Reports of Planetary Geology and Geophysics Program 1988: NASA Technical Memorandum 4130, p. 588–589.

115. Shoemaker, E.M., Shoemaker, C.S., and Wolfe, R.F., 1989, Asteroid and comet flux in the neighborhood of the Earth (abs.), in Reports of Planetary Geology and Geophysics Programs: NASA Technical Memorandum 4130, p. 105-107.

116. Williams, J.G., Shoemaker, E.M., and Wolfe, R.F., 1989, Structure in the Themis, Eos, and Koronis Families (extended abs.), in Lunar and Planetary Science XX, p. 1207-1208.

117. Bowell, E., Holt, H.E., Levy, D.H., Innanen, K.A., Mikkola, S., and Shoemaker, E.M., 1990, 1990 MB: A Mars Trojan (abs.): American Astronomical Society Bulletin, v. 22, p. 1357.

118. Shoemaker, C.S., and Shoemaker, E.M., 1990, Survey for bright Trojan asteroids (extended abs.), in Lunar and Planetary Science XXI, p. 1152-1153.

119. Shoemaker, C.S., Shoemaker, E.M., and Wolfe, R.F., 1990, Investigation of the Trojan asteroids (extended abs.), in Reports of Planetary Geology and Geophysics Program-1989: NASA Technical Memorandum 4210, p. 112-114.

120. Shoemaker, E.M., and Shoemaker, C.S., 1990, Proterozoic impact record of Australia (extended abs.), in Abstracts for the International Workshop on Meteorite Bombardment on the Early Earth: Lunar and Planetary Institute Contribution No. 746, p. 47-48.

121. Shoemaker, E.M., Shoemaker, C.S., Nishiizumi, K., Kohl, C.P., Arnold, J.R., Klein, J., Fink, D., Middleton, R., Kubik, P.W., and Sharma, P., 1990, Ages of Australian meteorite craters (abs.): Meteoritics. v. 25, p. 409.

122. Shoemaker, E.M., Shoemaker, C.S., Wolfe, R.F., and Holt, H.E., 1990, Earth-crossing asteroids, 1989 (extended abs.), in Lunar and Planetary Science XXI, p. 1154-1156.

123. Shoemaker, E.M., Shoemaker, C.S., Wolfe, R.F., and Holt, H.E., 1990, Earth-crossing asteroids update (extended abs.), in Reports of Planetary Geology and Geophysics Program-1989: NASA Technical Memorandum 4210, p. 103-105.

124. Anderson, R.R., Hartung, J.B., Shoemaker, E.M., and Roddy, D.J., 1991, New research core drilling in the Manson impact structure,

Iowa: A first look at the spectacular rocks formed at a K-T boundary impact site (abs.): Geological Society of America, Abstracts with Programs, v. 23, no. 5, p. A402.

125. Attrep, M., Jr., Orth, C.J., Quintana, L.R., Shoemaker, C.S., Shoemaker E.M., and Taylor, S.R., 1991, Chemical fractionation of siderophile elements in impactites from Australian meteorite craters (abs.), in Abstracts of papers submitted to the Twenty-second Lunar and Planetary Science Conference, part 1, Houston, March 18-22, 1991: Houston, Lunar and Planetary Institute, p. 39-40; also in Reports of Planetary Geology and Geophysics Program--1990: NASA Technical Memorandum 4300, p. 375-376.

126. Bowell, E., Muinonen, K., and Shoemaker, E.M., 1991, Discovery of Earth-crossing asteroids. III. Observing strategy (abs.), in International Conference on Near-Earth Asteroids Abstract Volume: San Juan Capistrano, San Juan Capistrano Research Institute, p. 5.

127. Holt, H.E., Bowell, E., Shoemaker, C.S., and Shoemaker, E.M., 1991, U.S. Geological Survey-Lowell Observatory asteroid survey: First results, (abs.) in Abstracts for the International Conference on Asteroids, Comets, Meteors 1991, Flagstaff, Arizona, June 24-28, 1991: Lunar and Planetary Institute Contribution no. 765, p. 93.

128. Hut, P., Shoemaker, E.M., Alvarez, W., and Montanari, A., 1991, Astronomical mechanisms and geologic evidence for multiple impacts on Earth (extended abs.), in Abstracts of papers submitted to the Twentysecond Lunar and Planetary Science Conference, part 2, Houston, March 18-22, 1991: Houston, Lunar and Planetary Institute, p. 603-604.

129. Hut, P., Shoemaker, E.M., Alvarez, W., and Montanari, A., 1991, Multiple impacts at Cretaceous-Tertiary boundary time: Break-up of a single comet? (abs.), in International Conference on Near-Earth Asteroids Abstract Volume: San Juan Capistrano, San Juan Capistrano Research Institute, p. 16.

130. Levison, H.F., Shoemaker, E.M., and Wolfe, R.F., 1991, Mapping the stability field of Jupiter Trojans (extended abs.), in Abstracts of papers submitted to the Twenty-second Lunar and Planetary science Conference, Houston, March 18-22, 1991: Houston, Lunar and Planetary Institute, p. 803-804; also in Reports of Planetary Geology and Geophysics Program--1990: NASA Technical Memorandum 4300, p. 397-398.

131. Levison, H.F., Shoemaker, E.M., and Wolfe, R.F., 1991, Mapping the stability field of Trojan orbits in the outer solar system (abs.), in Abstracts for the International Conference on Asteroids, Comets, Meteors 1991, Flagstaff, Arizona, June 24-28, 1991: Lunar and Planetary Institute Contribution no. 765, p. 135.

132. Muinonen, Karri, Bowell, Edward, Shoemaker, E.M., and Wolfe, R.F., 1991, discovery of Earth-crossing asteroids. II. Modeling the skyplane distribution (abs.), in International Conference on Near-Earth Asteroids Abstract Volume: San Juan Capistrano, San Juan Capistrano Research, p. 26.

133. Plescia, J., Shoemaker, E.M., and Shoemaker, C.S., 1991, Gravity survey of the Mt. Toondina impact structure, South Australia (extended abs.), in Abstracts of papers submitted to the Twenty-second Lunar and Planetary Science Conference, part 3, Houston, March 18-22, 1991: Houston, Lunar and Planetary Institute, p. 1079-1080; also in Reports of Planetary Geology and Geophysics Program: NASA Technical Memorandum 4300, p. 384-385.

134. Shoemaker, C.S., Shoemaker, E.M., Wolfe, R.F., 1991,

Systematic survey for bright Jupiter Trojans (abs.), in Abstracts for the International Conference on Asteroid, Comets, Meteors, 1991, Flagstaff, Arizona, June 24-28, 1991: Lunar and Planetary Institute Contribution no. 765, p. 199. 135. Shoemaker, E.M., 1991, Geological and astronomical evidence for comet impact and comet showers during the last 100 million year (abs.), in Abstracts for the International Conference on Asteroids, Comets, Meteors 1991: Lunar and Planetary Institute Contribution no. 765, p. 199. 136. Shoemaker, E.M., Wolfe, R.F., and Shoemaker, C.S., 1991, Asteroid flux and impact cratering rate on Venus (extended abs.), in Abstracts of papers submitted to the Twenty-second Lunar and Planetary Science Conference, part 3, Houston, Lunar and Planetary Institute, p. 1253-1254; also in Reports of Planetary Geology and Geophysics Program--1990: National Aeronautics and Space Administration Technical Memorandum 4300, p. 389-390. 137. Shoemaker, E.M., Wolfe, R.F., Shoemaker, C.S., Bowell, E., Muinonen, K., 1991, Discovery of Earth-crossing asteroids. I. History and goals for a future program (abs.), in International Conference on Near-Earth Asteroids Abstracts Volume: San Juan Capistrano, San Juan Capistrano Research Institute, p. 31. Steiner, M., Morales, M., and Shoemaker, E.M., 1991, Relative 138. ages of fossil caches, synchroneity of major lithology change, and formational age, as determined by magnetostratigraphic correlation (abs.): American Association of Petroleum Geologists Bulletin, Annual Convention Abstracts v. 75, p. 676. 139. Nishiizumi, K., Kohl, C.P., Arnold, J.R., Caffee, M.W., Finkel, R.C., Southern, J., Shoemaker, E.M., and Shoemaker, C.S., 1992, Exposure histories of desert sands using in situ produced cosmogenic nuclides (abs.): EOS, v. 73, no. 14 supplement, p. 185. Anderson, R.R., Hartung, J.B., Roddy, D.J., and Shoemaker, 140. E.M., 1992, Research core drilling in the Manson impact structure, Iowa (extended abs.), in Papers presented to the International Conference on Large Meteorite Impacts and Planetary Evolution, Aug. 31-Sept. 2, 1992, Sudbury, Ontario, Canada: LPI Contribution No. 790, p. 2-3. Shoemaker, E.M., 1992, Large-body impact is a geologic 141. process (abs.), in Geological Society of America Abstracts with Programs, 1992, p. A134. Shoemaker, E.M., and Izett, G.A., 1992, Stratigraphic 142. evidence from Western North America for multiple impacts at the K/T boundary (extended abs.), in Papers submitted to the XXIII Lunar and Planetary Science Conference: Lunar and Planetary Institute, Houston, Texas, p. 1293-1294. 143. Shoemaker, E.M., and Izett, G.A., 1992, K/T boundary stratigraphy: Evidence for multiple impacts and a possible comet stream (extended abs.), in Papers presented to the International Conference on Large Meteorite Impacts and Planetary Evolution, Aug. 31-Sept. 2, 1992, Sudbury, Ontario, Canada: LPI Contribution No. 790, p. 66-68. Shoemaker, E.M., and Steiner, M.B., 1992, Reversely 144. magnetized breccia from the Manson Impact Structure, Iowa (abs.): EOS, October 27, 1992, Supplement, p. 336. Anderson, R.R., Witzke, B.J., Hartung, J.B., Shoemaker, E.M., 145. and Roddy, D.J., 1993, Descriptions and preliminary interpretations of

cores recovered from the Manson Impact Structure (Iowa) (extended abs.),

in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 35-36.

146. Anderson, R.R., Witzke, B.J., Shoemaker, E.M., Roddy, D.J., and Hartung, J.B., 1993, Research core drilling in the Manson impact structure: Preliminary description of lithologic units (abs.), in Geological Society of America, Abstracts with Programs, v. 25, p.

147. Bowell, Edward, Levison, Harold F., Shoemaker, Eugene M., and Weissman, Paul R., 1993, The Population of the Trans-Neptunian Region, in Pluto & Charon, Flagstaff, Arizona, July 6-9, 1993, p. 13.

148. Roddy, D.J., and Shoemaker, E.M., 1993, The Manson Impact Crater: Estimation of the energy of formation, possible size of the impacting asteroid or comet, and ejecta volume and mass (extended abs.), in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 1211-1212.

149. Shoemaker, E.M., Herkenhoff, K.E., and Gostin, V.A., 1993, Impact origin of Upheaval Dome, Utah (abs.), in EOS, v. 74, October 26, 1993/Supplement, p. 388.

150. Shoemaker, C.S., Holt, H.E., Shoemaker, E.M., Bowell, E., and Levy, D.H., 1993, The Palomar Asteroid and Comet Survey (PACS), 1983-1993 (abs.), in Abstracts for IAU Symposium 160: Asteroids, Comets, Meteors 1993, Belgirate (Novara), Italy, June 14-18, 1993: LPI Contribution No. 810, p. 269.

151. Shoemaker, E.M., and Nozette, Stewart, 1993, Clementine: An inexpensive mission to the Moon and Geographos (extended abs.), in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 1299-1300.

152. Shoemaker, E.M., Roddy, D.J., and Anderson, R.R., 1993, Research program on the Manson Impact Structure, Iowa (extended abs.), in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 1301-1302.

153. Shoemaker, E.M., and Shoemaker, C.S., 1993, The flux of periodic comets near Earth, in Abstracts for IAU Symposium 160: Asteroids, Comets, Meteors 1993, Belgirate (Novara), Italy, June 14-18, 1993: LPI Contribution No. 810, p. 270.

154. Shoemaker, E.M., Shoemaker, C.S., and Levinson, H.F., 1993, Survey of the Jupiter Trojans, in Abstracts for IAU Symposium 160: Asteroids, Comets, Meteors 1993, Belgirate (Novara), Italy, June 14-18, 1993: LPI Contribution No. 810, p. 271.

155. Shoemaker, E.M., Shoemaker, C.S., and Levy, D.H., 1993, Collision of P/Shoemaker-Levy 9 with Jupiter (abs.), in American Astronomics Society Bulletin, v. 25, p. 1042.

156. Steiner, M.B., and Shoemaker, E.M., 1993, The late Cretaceous Manson impact structure (abs.). in EOS, v. 74, October 26, 1993/Supplement, p. 386.

157. Steiner, M.B., and Shoemaker, E.M., 1993, Two-polarity magnetization in the Manson impact breccia (extended abs.), in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 1347-1348.

158. Vorder Bruegge, R.W., Davies, M.E., Horan, D.M., Lucey, P.G.,

Pieters, C.M., McEwen, A.S., Nozette, S., Shoemaker, E.M., Squyres, S.W., and Thomas, P.C., 1993, The Clementine Misson science return at the Moon and Geographos (extended abs.), in Abstracts of papers submitted to the Twenty-third Lunar and Planetary Science Conference, Houston, March 15-19, 1993: Houston, Lunar and Planetary Institute, p. 1469-1470. 159. Vorder Bruegge, R.W., and Shoemaker, E.M., 1993, The

Clementine Mission to the Moon and NEA 1620 Geographos (abs.), in American Astronomical Society Bulletin, v. 25, p. 1091-1092.

160. Anderson, R.R., Witzke, B.J., Roddy, D.J., and Shoemaker, E.M., 1994, Core drilling in the Manson impact structure provides abundant research materials and new insights into the geology of a wellpreserved complex impact crater (abs.), in Abstracts with Programs, Geological Society of America, 1994 Annual Meeting, October 24-28, 1994, Seattle, Washington, v. 26, no. 7, p. A-337.

161. Izett, G.A., Masaitis, V.L., Shoemaker, E.M., Dalrymple, G.B., and Steiner, M.B., 1994, Eocene Age of the Kamensk Buried Crater of Russia (extended abs.), in Papers Presented to New Developments Regarding the KT Event and Other Catastrophes in Earth History, February 9-12, 1994: Houston, Lunar and Planetary Institute, p. 55-56.

162. Pieters, C.M., Staid, M.I., Fischer, E.M., Shoemaker, G., and the Clementine Science Team, 1994, Spectral Units of Large Lunar Craters from Clementine Data (abs.), in Abstracts submitted to AGU, 1994 Spring Meeting, May 23-27, Baltimore, Maryland, p. 222.

163. Robinson, M.S., and Shoemaker, E.M., 1994, Volcanic Materials of the Schroedinger Basin: Timing and Emplacement Mechanisms (abs.), in EOS, Transactions, American Geophysical Union, 1994 Fall Meeting, November 1, 1994, v. 75, no. 44, p. 399.

164. Roddy, D.J., Shoemaker, E.M., and Anderson, R.R., 1994, The Manson Impact Structure Research Program: A summary of results (abs.), in Abstracts with Programs, Geological Society of America, 1994 Annual Meeting, October 24-28, 1994, Seattle, Washington, v. 26, no. 7, p. A-337.

165. Shoemaker, E.M., 1994, Clementine at Geographos (abs.), in Abstracts submitted to AGU, 1994 Spring Meeting, May 23-27, Baltimore, Maryland, p. 222.

166. Shoemaker, E.M., 1994, Late Impact History of the Solar System (abs.), in Abstracts submitted to AGU, 1994 Spring Meeting, May 23-27, Baltimore, Maryland, p. 50.

167. Shoemaker, E.M., 1994, Update on the Impact Rates in the Jovian System (abs.), in Icy Galilean Satellites Conference, February 1-3, 1994: San Juan Capistrano, San Juan Capistrano Research Institute, p. 77.

168. Shoemaker, E.M., 1994, The Moon and Voyager: Highlights of Solar System Exploration, Invited lecture at History Sessions, Astronomical Society of the Pacific, June 28, 1994 Meeting, Flagstaff, Arizona at Lowell Observatory.

169. Shoemaker, E.M., 1994, Ignorance of History is Bliss (abs.), in Abstracts with Programs, Geological Society of America, 1994 Annual Meeting, October 24-28, 1994, Seattle, Washington, v. 26, no. 7, p. A-281.

170. Shoemaker, E.M., 1994, Clementine at the Moon (abs.), Bull. America Astronomical Soc., v. 26, p.1426.

171. Shoemaker, E., and Cheng, A.F., 1994, Near Earth Asteroid Returned Sample (NEARS) (abs.), in Book of Abstracts: IAA International

Conference on Low-Cost Planetary Missions at The Johns Hopkins University, Laurel, Maryland, April 12-15, 1994, p. 6. Shoemaker, E.M., and Shoemaker, C.S., 1994, The Crash of 172. P/Shoemaker-Levy 9 into Jupiter and its Implications for Comet Bombardment on Earth (extended abs.), in Papers presented to New Developments Regarding the KT Event and Other Catastrophes in Earth History, February 9-12, 1994: Houston, Lunar and Planetary Institute, p. 113-114. Shoemaker, E.M., Hassig, P.J., and Roddy, D.J., 1994, Impact 173. Plume Dynamics on Jupiter (abs.), in EOS, Transactions, American Geophysical Union, 1994 Fall Meeting, November 1, 1994, v. 75, no. 44, p. 402. 174. Shoemaker, E.M., Robinson, M.S., and Eliason, E.M., 1994, Age Relation of the Schroedinger Multiring Basin Determined from Clementine Images (abs.), in EOS, Transactions, American Geophysical Union, 1994 Fall Meeting, November 1, 1994, v. 75, no. 44. p. 399. 175. Steiner, M.B., and Shoemaker, E.M., 1994, The Late Cretaceous Manson Impact Structure (abs.), in EOS, Transactions, American Geophysical Union Spring Meeting, May 23-27, Baltimore, Maryland, v. 75, no. 16, Supplement p. 123. Steiner, M. and Shoemaker, E., 1994, Two-polarity 176. magnetization of the Manson impact breccias (abs.), in Abstracts with Programs, Geological Society of America, 1994 Annual Meeting, October 24-28, 1994, Seattle, Washington, v. 26, no. 7, p. A-338. Weaver, H.A., Noll, K.S., Storrs, A.D., Smith, T.E., A'Hearn, 177. M.F., Arpigny, C., Feldman, P.D., Boice, D.C., Stern, A., Lamy, P.L., Larson, S.M., Levy, D.H., Scotti, J.V., Marsden, B.G., Meech, K.J., Shoemaker, C.S., Shoemaker, E.M., Sekanina, Z., Trauger, J.T., Yeomans, D.K., and Zellner, B., 1994, HST monitoring of Comet P/Shoemaker-Levy 9 (abs.), Bull. American Astronomical Soc., v. 26, p. 1564. McEwen, A.S., and Shoemaker, E.M., 1995, Two classes of 178. impact basins on the Moon (extended abs.), in Abstracts of papers submitted to the Twenty-sixth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 935-936. 179. Robinson, M.S., and Shoemaker, E.M., 1995, Clementine UVVIS high resolution spectral measurements of lunar local dark mantle deposits(abs.) in, Abstracts with Program, Geological Society of America, 1995 Annual Meeting, November 6-9, 1995, New Orleans, Louisiana, p. A-289. 180. Roddy, D.J., and Shoemaker, E.M., 1995, Meteor Crater (Barringer Meteorite Crater), Arizona: Summary of impact conditions (abs.), in Meteoritics, 58th Annual Meeting, Meteoritical Society, Washington, D.C., September 11-15, 1995, v. 30, no. 5, p. 567. Roddy, D.J., Shoemaker, E.M., and Anderson, R.R., 1995, 181. Manson impact structure research program: Summary through January 1995 (extended abs.), in Abstracts of papers submitted to the Twenty-sixth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 1181-1182. Schmitt, H.H., Griffin, M.D., Kulcinski, G.L., and Shoemaker, 182. E.M., 1995, Interlune-One: A scientific mission across the surface of the Moon (abs.), in Abstracts of papers submitted to the Twenty-sixth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 1241-1242. 183. Shoemaker, E.M., and Robinson, M.S., 1995, Clementine

observations of melt rocks and volcanic materials in the Schrödinger Basin (extended abs.), in Abstracts of papers submitted to the Twentysixth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 1297-1298.

184. Shoemaker, E.M., Roddy, D.J., Moore, C.B., Pfeilsticker, R., Curley, C.L., Dunkelman, T., Kuerzel, K., Taylor, M., Shoemaker, C., and Donnelly, P., 1995, Impact crater identified on the Navajo Nation near Chinle, Arizona (abs.), in Meteoritics, 58th Annual Meeting, Meteoritical Society, Washington, D.C., September 11-15, 1995, v. 30, p. 578-579.

185. Kargel, J.S., Coffin, P., Kraft, M., Lewis, J.S., Moore, C., Roddy, D., Shoemaker, E.M., and Wittke, J.H., 1996, Systematic collection and analysis of meteoritic materials from Meteor Crater (extended abs.), in Abstracts of papers submitted to the Twenty-seventh Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 645-646.

186. Kriens, B. J., Herkenhoff, K.E., and Shoemaker, E.M., 1996, Structure and kinematics of a complex crater, Upheaval Dome, SE Utah (abs.), in Abstracts with Programs, 1996 Annual Meeting, Geological Society of America: Denver, Colorado, October 28-31, 1996, p. A-108. 187. Nozette, S., Lichtenberg, C.L., Spudis, P. Bonner, R., Ort,

W., Malaret, E., Robinson, M., and Shoemaker, E., 1996, Clementine bistatic radar experiment: Preliminary results (abs.), in Abstracts of papers submitted to the Twenty-seventh Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 967.

188. Robinson, M.S., Shoemaker, E.M., and Hawke, B.R., 1996, Spectral heterogeneity of lunar local dark mantle deposits (extended abs.), in Abstracts of papers submitted to the Twenty-seventh Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, p. 1087-1088.

189. Shoemaker, E.M., 1996, Exploration of near-earth asteroids (abs.), in 1996 AAAS Annual Meeting and Science Innovation Exposition: Baltimore, Maryland, Feb. 8-13, 1996, p. A-52.

190. Shoemaker, E.M., 1996, Impact sites of comets and asteroids (abs.) in 1996 AAAS Annual Meeting and Science Innovation Exposition: Baltimore, Maryland, Feb. 8-13, 1996, p. A-159-A160.

191. Shoemaker, E.M., 1996, The Age of Europa's Surface (abs.), in Europa Ocean Conference, Capistrano Conference No. 5, San Juan Capistrano Research Institute, San Juan Capistrano, California, Nov. 12-14, 1996, p. 65-66.

192. Shoemaker, E.M., Nishiizumi, K., and Kohl, C.P., 1996, The frequency of impact events similar in energy to the Tunguska event (abs.), in International Workshop Tunguska 96: Bologna, Italy, July 15-17, 1996, p. 23.

193. Shoemaker, E.M. and Shoemaker, C.S., 1996, The impact record of Australia (abs.), in Geological Society of Australia, Abstracts No. 41: 13 Australian Geological Convention, Canberra, Feb. 1996, p. 391. 194. Shoemaker, E.M. and Shoemaker, C.S., 1996, Small body collisions with the Earth (abs.), in Asteroids, Comets, Meteors COSPAR

Colloquium 10: Versailles, France, July 8-12, 1996, p. 2.

195. Shoemaker, E.M. and Shoemaker, C.S., 1996, Possible variations in the long-term comet flux and their correlation with global climate (abs.), EOS, v. 77, no. 22, Supplement, P42A.

196. Shoemaker, E.M. and Uhlherr, H.R., 1996, Stratigraphic relations of tektites and Pleistocene uplift in the Port Campbell

Embayment, Victoria (abs.), EOS, v. 77, no. 22, Supplement, p. 42A2. 197. Shoemaker, E.M., 1997, Long-term variations in the impact cratering rate on Earth (abs.), in Meteorites: Flux with Time and Impact Effects, 18 - 19th February, 1997, Geol. Soc. London, Burlington House, London: p. 41.

198. Shoemaker, E.M., 1997, How young is Europa's surface? (abs.), in 1997 American Association for the Advancement of Science Annual Meeting and Science Innovation Exposition, 13-18 February, Seattle, Washington: p. A-76.

199. Shoemaker, E.M., and Shoemaker, C.S., 1997, Notes on the geology of Liverpool Crater, Northern Territory, Australia (extended abs.), in Abstracts of papers submitted to the twenty-eighth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, March 17-21, 1997, p. 1311-1312.

200. Shoemaker, E.M., and Shoemaker, C.S., 1997, Glikson, a probable impact structure, Western Australia (extended abs.), in Abstracts of papers submitted to the twenty-eighth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, March 17-21, 1997, p. 1309-1310.

201. Shoemaker, E.M. and Shoemaker, C.S., 1997, Dispersion of stones by human transport: A Solution to the enigma of australite "stratigraphic ages" (abs.), in American Geophysical Union 1997 Spring Meeting, EOS, v. 78, no. 17 Supplement, p. 5201.

202. Shoemaker, E.M., and Wynn, J.C., 1997, Geology of the Wabar meteorite craters, Saudi Arabia (extended abs.), in Abstracts of papers submitted to the twenty-eighth Lunar and Planetary Science Conference, Lunar and Planetary Institute, Houston, Texas, March 17-21, 1997, p. 1313-1314.