

MUKUL SHARMA

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Education

Ph.D. Geology, University of Rochester, Rochester, New York (1993).
Advisor: Asish R. Basu
M.S. Geology, University of Rochester, Rochester, New York (1989).
M.Sc. Applied Geology, Indian Institute of Technology, Bombay, India (1986)
B.Sc. (Honors) Applied Geology, University of Delhi, Delhi, India (1983).

Professional Experience

Assistant Professor, Department of Earth Sciences, Dartmouth College
(January 2001–present)
Staff Scientist Max-Planck Institute for Chemistry, Mainz, Germany
(January 2000–December 2000)
Max-Planck Fellow Max-Planck Institute for Chemistry, Mainz, Germany.
(April 1997–December 2000)
Visiting Associate in Geochemistry, California Institute of Technology, Pasadena, California.
(March 1998–May 1998)
Associate Scientist, California Institute of Technology, Pasadena, California.
(December 1995 – April 1997)
Research Fellow in Geochemistry, California Institute of Technology, Pasadena, California.
(December 1992–December 1995).
Supervisor: Gerald J. Wasserburg

Research Interests

Origin and evolution of early Earth
Platinum Group Element chemistry of natural waters
Large igneous provinces
Generation of oceanic lithosphere
Ion transport during weathering
Solar magnetism and terrestrial climate

Professional Society Memberships

American Geophysical Union
Geochemical Society
Sigma Xi

Professional Activities:

(1) Reviewer for (a) professional papers in *Geochimica et Cosmochimica Acta*, *Earth and Planetary Science Letters*, *Journal of Petrology*, *Science*, *Journal of Atmospheric and Terrestrial*

MUKUL SHARMA

Physics and (b) research proposals for the National Science foundation, National Research Council, UK, and Swedish National Science Research Council.

(2) Co-organizer of an international workshop called Geotraces in Toulouse, France with about 85 participants to plan the future of trace element and isotope investigations in oceans. (13-16 April, 2003). Other organizers are Bob Anderson (Lamont Doherty Earth Observatory of the Columbia University), Roger Francois (Woods Hole Oceanographic Institution), Gideon Henderson (Oxford Univ.), Catherin Jeandel (CNRS, Toulouse), and Martin Frank (ETH, Zuerich). Associate member of GEOTRACES Planning Group, Scientific Committee on Oceanic Research.

Invited Lectures:

Caltech (1992), Max Planck Institute for Chemistry, Mainz (1996), Scripps (1997), ETH, Zuerich (1998), University of Maryland, College Park (1999), University of Rochester (1999), Yale (March 4, 2002), Woods Hole Oceanographic Institution (April 19, 2002), Boston University (March 27, 2003), University of Colorado (Sept 2005), Dartmouth College (Physics & Astronomy Colloquium, Oct 2005); University of Vermont (Nov 2005), Yale University (June 2006), Norwich University (Oct 2006).

HONORS AND AWARDS

- 1. Dartmouth College:** Junior Faculty Fellowship.
- 2. Max-Planck Gesellschaft:** Max-Planck Fellowship, 1996-1999.
- 3. Geological Society of America:** Penrose Grants for field work in the East Indian Craton, 1988 and 1989.
- 4. Indian Institute of Technology, Bombay:** Institute Silver Medal (Institute's highest award given to the student at the top of the graduating class). November 1985.
- 5. Ministry of Education and Culture, Government of India:** National Merit Scholarship, 1983-1985.

TEACHING

Max-Planck-Institut für Chemie

1. Kompaktkurs Geochemie, October 1997 and 1999. Lectured on the Geochemistry of the Earth's Mantle and supervised a group of graduate students in ultra-clean laboratory methods and mass spectrometry.
2. Supervised two postdoctoral fellows (1. Dr. M. Benoit CNRS, Brest, France; 2. Dr. K. Balakrishna, Mysore, India) and a doctoral candidate (Dr. Jürgen Eisele, Mainz, Germany).

California Institute of Technology

Guest lecturer in Geochemistry for a Graduate Class offered by Dr. G. J. Wasserburg. Spring 1996. Lectured on the Geochemistry of Pb.

Dartmouth

Courses Taught

1. EARS 7: From Big Bang to Planet Earth: How did we get here?
2. EARS 8/Human Biology 1/CoCo-4: Life on Mars? (co-taught with J. Buckey, Professor of Medicine, and L. Davies, Professor of Literature) (*The Chronicle of Higher Education*, May 18, 2001)
3. EARS 62: Geochemistry
4. EARS 69: Igneous and Metamorphic Petrology
5. EARS 108: Radiogenic Isotope Geochemistry

Students Advised

1. Emily Schaller (Senior Thesis; now a Graduate Student at Caltech): co-advisor with Leslie Sonder. Title: **Consequences of rotational bursting for the terrestrial accretion of the ^3He retentive interplanetary dust (2002).**
2. Jonathan Lu (Senior Thesis; at present working towards his Medical degree at Yale Univ). Title: **An isotopic study of cosmic spherules from the South Pole water well (2002)**
3. David Zylberberg (Senior Thesis; now a Graduate Student at Columbia): Title: **High resolution record of seawater osmium isotopes over the last 100,000 years (2004)**
4. Ross Markwort (Senior Thesis; now a Graduate Student at Boston College; co-advisor with Xiahong Feng and Jim Aronson) Title: **$\delta^{18}\text{O}$ in Early Holocene Gastropods from Lake Galana Boi, Kenya: Characterizing the African Humid Period (2004)**
5. Evelyn Mervine (Senior Thesis; now a graduate student at MIT/WHOI): **Petrogenesis of alkaline lavas associated with deccan flood basalts (2006)**
6. Erin Rosenberg (MS; now at the Chemistry Department, Dartmouth): **The osmium budget of the oceans from the off-axis hydrothermal fluid flux (2004)**
7. Chris Oze (Obering Postdoctoral Fellow; now an Assistant Professor at Bryn Mawr College)

At present, he is advising the following students:

1. Rasmus Andreasen (Ph.D.): expected completion date June 2007
2. Cynthia Chen (Ph.D.) : expected completion date: June 2008
3. Elena Ramirez (Ph.D.): expected completion date: June 2007
4. Lauren Edgar (NASA Space Grant Undergraduate Fellow).
5. Jacob Aguiar (Undergraduate researcher in Anthropology)

The following students have worked in his laboratory as research assistants:

1. Jamie deLemos (Graduate student)
2. Gretchen Gehrke (Undergraduate researcher)
3. Zhaohui Zhang (Graduate Student)
4. Kevan Grimaldi (undergraduate researcher)
5. Carmen Springer (undergraduate researcher)
6. Evelyn Mervine (undergraduate researcher)
7. Lauren Edgar (undergraduate researcher)

PUBLICATIONS

1. A. R. Basu, M. Sharma, and P.G. DeCelles (1990) Nd-Sr isotopic provenance and trace element geochemistry of Amazonian Foreland Basin Sands, Bolivia and Peru: implications for ensialic Andean orogeny. *Earth Planet. Sci. Lett.* **100**, 1-17.
2. M. Sharma, A. R. Basu, and R. B. Cole (1991) Bimodal Volcanism by MORB-Continental Crust Interaction: Nd, Sr-isotopic and geochemical evidence from Southern San Joaquin Basin, California. *Contrib. Mineral. Petrol.* **109**, 159-172.
3. M. Sharma, A. R. Basu, and G. V. Nesterenko (1991) Nd-Sr isotopes, petrochemistry, and origin of the Siberian Flood Basalts, USSR. *Geochim. Cosmochim. Acta* **55**, 1183-1192.
4. M. Sharma, A. R. Basu, and G. V. Nesterenko (1992) Temporal Sr-, Nd- and Pb-isotopic variations in the Siberian Flood Basalts: implications for the plume-source characteristics. *Earth Planet. Sci. Lett.* **113**, 365-381.
5. M. Sharma, A. R. Basu, and S. L. Roy (1994) Sm-Nd isotopic and geochemical study of the Archean tonalite-amphibolite association from the eastern Indian Craton. *Contrib. Mineral. Petrol.* **117**, 45-55.
6. M. Sharma, D.A. Papanastassiou, G.J. Wasserburg and R.F. Dymek (1994) The problem of high precision measurements of $^{142}\text{Nd}/^{144}\text{Nd}$: the terrestrial record of ^{146}Sm . *Lunar Planet. Sci. Conf.* **XXV**, 1253-1254.
7. M. Sharma, G. J. Wasserburg, D. A. Papanastassiou, J.E. Quick, E.V. Sharkov and E.E. Laz'ko (1995a) High $^{143}\text{Nd}/^{144}\text{Nd}$ in extremely depleted mantle rocks. *Earth Planet. Sci. Lett.* **125**, 101-114.
8. M. Sharma, D.A. Papanastassiou and G.J. Wasserburg (1995b) Sm-Nd systematics of a large eucrite clast in the Vaca Muerta mesosiderite and initial solar system ^{146}Sm abundance. *Lunar Planet. Sci. Conf.* **XXVI**, 1271-1272.
9. M. Sharma, G.J. Wasserburg, D.A. Papanastassiou, J.E. Quick, E.V. Sharkov and E.E. Laz'ko (1995c) Extreme Sm-Nd fractionation due to melting in the oceanic upper mantle: evidence from Polar Urals Ophiolite. *Lunar Planet. Sci. Conf.* **XXVI**, 1273-1274.
10. A. R. Basu, M. Sharma, and W. R. Premo (1996) U-Pb age of an Older Metamorphic Group mica schist: earliest terrain of the Eastern Indian Craton. In: *Recent Researches in Geology and Geophysics of the Precambrians*, Ed. A. K. Saha, Recent Researches in Geology, Volume 16, p 93-102, Hindustan Publishing Corporation (India), New Delhi.
11. M. Sharma, D. A. Papanastassiou, G. J. Wasserburg and R.F. Dymek (1996a) The issue of the terrestrial record of ^{146}Sm . *Geochim. Cosmochim. Acta* **60**, 2037-2047.

MUKUL SHARMA

12. M. Sharma, D. A. Papanastassiou, G. J. Wasserburg and R.F. Dymek (1996b) Reply to the Comment on "The issue of the terrestrial record of ^{146}Sm " by S.B. Jacobsen and C.L. Harper Jr. *Geochim. Cosmochim. Acta* **60**, 3751-3754.
13. M. Sharma and G.J. Wasserburg (1996c) The neodymium isotopic compositions and rare earth patterns in highly depleted ultramafic rocks. *Geochim. Cosmochim. Acta* **60**, 4537-4550.
14. M. Sharma, D.A. Papanastassiou and G.J. Wasserburg (1997a) The osmium isotopic composition and concentration in the oceans: terrestrial and extraterrestrial sources. *Lunar Planet. Sci. Conf.* **XXVIII**, 1281-1282.
15. M. Sharma, D. A. Papanastassiou, and G. J. Wasserburg (1997b) The concentration and isotopic composition of osmium in the oceans. *Geochim. Cosmochim. Acta* **61**, 3287-3299.
16. M. Sharma (1997) Siberian Traps. In: *Large Igneous Provinces: Continental, Oceanic, and Planetary Flood Volcanism*. Eds. J. J. Mahoney and M. Coffin, AGU Monograph, Volume 100, p 273-295, American Geophysical Union, Washington D.C.
17. M. Sharma and G. J. Wasserburg (1997) Osmium in the rivers. *Geochim. Cosmochim. Acta* **61**, 5411-5416.
18. M. Sharma, G. J. Wasserburg, A. W. Hofmann, and G. J. Chakrapani (1999) Himalayan uplift and osmium isotopes in oceans and rivers, *Geochim. Cosmochim. Acta*, **63**, 4005-4012.
19. M. Sharma, G. J. Wasserburg, A. W. Hofmann, and D. A. Butterfield (2000) Osmium Isotopes in Hydrothermal Fluids from the Juan de Fuca Ridge. *Earth Planet. Sci. Lett.*, 179: 139-152.
20. M. Sharma, M. Polizzotto, and A.D. Anbar (2001) Iron Isotopes in Hot Springs along the Juan de Fuca Ridge. *Earth Planet. Sci. Lett.*, 194, 39-51.
21. J. Eisele, M. Sharma, J. Blichert-Toft, C. Devey, S. Galer, and A. W. Hofmann (2002) The role of sediment recycling in EM-1 inferred from Os, Pb, Hf, Nd, Sr isotope and trace element systematics of the Pitcairn hotspot. *Earth Planet. Sci. Lett.*, 196 (3-4): 197-212.
22. M. Sharma (2002) Variations in Solar Magnetic Activity during the last 200,000 years: Is there a Sun-Climate Connection? *Earth Planet. Sci. Lett.*, 199 (3-4): 459-472.
23. D.A. Papanastassiou, M. Sharma, H. H. Ngo, G. J. Wasserburg, R. F. Dymek (2003) No ^{142}Nd excess in early Archean Isua gneiss IE 715-28. *Lunar Planet. Sci. Conf.* **XXXIV**, #1851.
24. LEXEN Scientific Party (2003) Probing for life in the ocean crust with the LEXEN Program, *Eos*, Transactions, American Geophysical Union, **84**, pp.109, 112, 25 Mar 2003.
25. M. Frank, C. Jeandel, R. F. Anderson, G. Henderson, R. Francois, M. Sharma (2003) GEOTRACES: Studying the global marine biogeochemistry of trace elements and isotopes, *Eos*, Transactions, American Geophysical Union, **84**, pp. 327, 330, 26 Aug 2003.

26. M. Sharma and C. Chen (2004) Neodymium isotope fractionation in the mass spectrometer and the issue of ^{142}Nd anomalies in the early Archean rocks. *Precambrian Research* 134: 315-329.
27. C. Chen, S. Taylor, and M. Sharma (2005) Iron and Osmium Isotopes from stony micrometeorites and implications for the Os budget of the ocean. *Lunar Planet. Sci. Conf. XXXVI*, #2134.
28. C. Oze and M. Sharma (2005) Have olivine, will gas: Serpentinization and the abiogenic production of methane on Mars. *Geophys. Res. Lett.* 32 (10): Art. No. L10203 MAY 26.
29. R. Andreasen and M. Sharma (2006) Solar nebula heterogeneity in p-process Sm and Nd isotopes. *Science*. 314: 806-809.
30. C. Chen, M. Sharma and B. Bostick (2006) Lithologic controls on the Os isotopic composition in the Rio Orinoco. *Earth Planet. Sci. Lett.* 252 (1-2): 138-151.
31. C. Oze and M. Sharma (2006) Serpentinization and the Inorganic Synthesis of H_2 in Planetary Surfaces. *Icarus*. doi:10.1016/j.icarus.2006.09.012
32. K. Turekian, M. Sharma and G. Williams (2006) The behavior of natural and anthropogenic osmium in the Hudson River-Long Island Sound Estuarine Systems. *Geochim. Cosmochim. Acta*, Accepted Pending Revision, Nov. 2006.
33. M. Sharma, E. R. Rosenburg, and D. A. Butterfield (2006) Search for the proverbial mantle osmium sources to the oceans: Hydrothermal alteration of mid-ocean ridge basalt. *Geochim. Cosmochim. Acta*, Accepted Pending Revision, Nov 2006.
34. R. Andreasen and M. Sharma (2007) Decoupling of the Barium and Lanthanide r-process nuclide sources: constraints on the origin of ^{142}Nd anomalies. *Lunar Planet. Sci. Conf. XXXVIII*, #2242.
35. M. Sharma, K. Balakrishna, A. W. Hofmann, R. Shankar (2006) The behavior of osmium isotopes in a tropical estuary. *Geochim. Cosmochim. Acta*. Accepted Pending Revision, Feb 2007.
36. R. Andreasen and M. Sharma (2007) Decoupling of the Barium and Lanthanide r-process nuclide sources: constraints on the origin of ^{142}Nd anomalies. *The Astrophysical J.* Accepted Pending Revision, Feb 2007.

ABSTRACTS

1. A.R. Basu, B.E. Faggart, Jr., and M. Sharma (1988) Sm-Nd isotopic study of wollastonite skarn and garnet-amphibolite metamorphism in the Adirondack Mountains, New York. *Trans. Amer. Geophys. Union* **69** (16), 468.
2. A.R. Basu, B.E. Faggart, Jr., and M. Sharma (1989) Implications of Nd-Isotopic study of Proterozoic Garnet Amphibolites and Wollastonite Skarns from the Adirondack Mountains, New York. *Inter. Geol. Congr. Washington, D.C.* **1**, 95-96.
3. M. Sharma, A.R. Basu, and P.G. DeCelles (1989) Nd-Sr isotopes and trace element geochemistry of Amazonian fluvial sands from Bolivia and Peru: Implications of magma contamination in Central Volcanic Zone (CVZ) and tectonics of the Andes. *Geol. Soc. America Abstr. with Programs*, A-190.
4. M. Sharma, R.B. Cole, P.G. DeCelles, and A.R. Basu (1990) Basalt-Dacite Volcanism by MORB-Continental Crust interaction: Sr-Nd isotopic and trace element evidence, Tecuya volcanics, Southern California. *Trans. Amer. Geophys. Union* **71** (17), 665.
5. A.R. Basu and M. Sharma (1990) Hotspots, Mantle Plumes, and the origin of Continental Flood Basalts. *Trans. Amer. Geophys. Union* **71** (43), 1669.
6. M. Sharma, A.R. Basu, and G.V. Nesterenko (1990) Nd, Sr-Isotopic geochemistry and petrogenesis of the Siberian Flood Basalts. *Trans. Amer. Geophys. Union* **71** (43), 1669.
7. M. Sharma and A.R. Basu (1991) Continental Flood Basalt Volcanism: a general model. *Geol. Soc. America Abstr. with Programs*, A-331.
8. A.R. Basu and M. Sharma (1992) REE Geochemistry of the Permo-Triassic Siberian Flood Basalts. *Trans. Amer. Geophys. Union* **73** (14), 329.
9. M. Sharma, A.R. Basu, and G.V. Nesterenko (1992) Temporal Sr, Nd, and Pb-Isotopic Variations in the Siberian Flood Basalts: Implications for the Plume-Source Characteristics. *Trans. Amer. Geophys. Union* **73** (14), 329.
10. A.R. Basu and M. Sharma (1993) Field and Geochemical Study of 3.3 Ga-old Tonalite-Amphibolite association from the eastern Indian Craton and implications for tonalite petrogenesis. *Geol. Soc. America Abstr. with Programs*,
11. M. Sharma, D.A. Papanastassiou, G.J. Wasserburg and R.F. Dymek (1994) Possible ^{142}Nd excess in 3.8 \AA Isua Supracrustals. *ICOG 8 (abst.)*, U.S. Geological Survey Circular 1107, (eds. M. A. Lanphere, G. R. Dalrymple and B. D. Turrin) 287.
12. M. Sharma, D.A. Papanastassiou, G.J. Wasserburg and M. Roy-Barman (1994) Relative chronology of tectonites and layered sequences in ophiolite complexes. *Geol. Soc. America Abstr. with Programs* **26** (7), A-39.

13. M. Sharma, and G.J. Wasserburg (1995) Large volumes of harzburgites in the mantle as a possible source of high Sm/Nd and ϵ_{Nd} . European Association of Geochemistry: *Earliest History of the Earth*, Cambridge University, United Kingdom.
14. M. Sharma, and G.J. Wasserburg (1997) Osmium and iridium in natural waters: comparisons and consequences. *Isotopes in the Solar System*, Physical Research Laboratory, Ahmedabad, India.
15. M. Sharma, and G.J. Wasserburg (1997) Osmium concentration and isotopic composition in rivers. *Trans. Amer. Geophys. Union* **78** (46), F378.
16. M. Sharma, N. Clauer and T. Toulkeridis (1998) Rhenium-Osmium isotopic systematics of an ancient laterite profile. *Mineralogical Magazine*, **62A** , 1373-1374.
17. M. Sharma, A. W. Hofmann, and G. J. Wasserburg (1998) Melt generation beneath ocean ridges: Re-Os isotopic evidence from the Polar Ural ophiolite. *Mineralogical Magazine* **62A** , 1375-1376.
18. D. Porcelli, M. Sharma, and G. J. Wasserburg (1998) The behavior of Os isotopes in the Columbia River estuary. *Mineralogical Magazine* **62A** , 1202-1203.
19. M. Sharma, G. J. Wasserburg, A. W. Hofmann, and G. J. Chakrapani (1998) The Osmium isotopic composition of the suspended and dissolved load in the Ganges: implications for the evolution of the seawater Os. *Trans. Amer. Geophys. Union* F519.
20. M. Benoit, M. Sharma, A. W. Hofmann (1998) Highly Radiogenic Osmium in Oman Mafic Cumulates. *Trans. Amer. Geophys. Union*. F1006.
21. D. Porcelli, M. Sharma, and G. J. Wasserburg (1998) A Comparison of the Behavior of Os, U, and Th Isotopes in the Columbia River Estuary. *Trans. Amer. Geophys. Union* F426.
22. M. Sharma, G. J. Wasserburg, and A. W. Hofmann (1999) Os Isotopes in Hydrothermal Fluids from the Juan de Fuca Ridge. *J. Conf. Abst.* 4, 578.
23. M. Sharma, A. W. Hofmann, G. J. Wasserburg, D. A. Butterfield (1999) Ancient depleted mantle under a modern spreading center: osmium evidence from hydrothermal fluids from Juan de Fuca Ridge. In *Ninth Annual V. M. Goldschmidt Conference*, p. 267. LPI Contribution No. 971, Lunar and Planetary Institute, Houston.
24. M. Sharma (2000) Long-term variations in Solar Magnetic Activity: Is there a sun-climate connection. 10th Annual Goldschmidt Conference, Oxford, September 3rd-8th 2000. p. 915-916. Symposium: Rapid Climate Change (Continents/Oceans).
25. M. Sharma, K. Balakrishna, A.W. Hofmann, R. Shankar (2001) Contrasting behavior of osmium within the Godavari River estuary, India. American Geophysical Union, Spring Meeting, Boston.

MUKUL SHARMA

26. M. Sharma and W. Abouchami (2001) High-Resolution Records of Osmium Isotopes in Ferro-Manganese Crusts Yield Unexpected Results, American Geophysical Union, Fall Meeting, San Francisco.
27. R. Andreasen, M. Sharma, P. Horan, G. E. Brüggman, and K.V. Subbarao (2002) Evolution of Deccan lavas: insights from Re-Os isotopes and Platinum Group Elements, American Geophysical Union, Fall Meeting, San Francisco.
28. M. Sharma (2003) Modulation of atmospheric carbon dioxide by global electric circuit. EGS-AGU-EUG Joint Assembly, *Geophysical Research Abstracts* **5**, EAE03-A-14288
29. M. Sharma (2003) Correlation between $^{148}\text{Nd}/^{144}\text{Nd}$ and $^{150}\text{Nd}/^{144}\text{Nd}$ ratios and the issue of ^{142}Nd anomalies in early Archean rocks. 13th Annual Goldschmidt Conference, Kurashiki, Japan.
30. M. Sharma and C. Chen (2004) Early Earth Differentiation using the coupled ^{146}Sm - ^{142}Nd and ^{147}Sm - ^{143}Nd System. 14th Annual Goldschmidt Conference, Copenhagen, Denmark.
31. R. Andreasen, K. V. Subbarao, M. Sharma (2004) ^{142}Nd anomalies in Deccan Traps. 14th Annual Goldschmidt Conference, Copenhagen, Denmark.
32. D. Zylberberg, M. Sharma, S. Goldstein and A. Piotrowski (2004) High Resolution Record of Seawater Osmium Isotopes Over the Last 100,000 Years. Eos Transactions of American Geophysical Union, Fall Meeting, San Francisco.
33. M. Sharma, R. Andreasen (2005) Remains of an enriched Hadean protocrust in modern mantle?, Goldschmidt Conference, Moscow, Idaho.
34. M. Sharma, E. Rosenberg, and D.A. Butterfield (2005) Search for the proverbial cosmic/mantle osmium sources to the oceans, American Geophysical Union Meeting, San Francisco.
35. R. Andreasen, M. Sharma (2005) High Precision Neodymium Isotope Measurements - Reconciling Chondrite Meteorite and Terrestrial Flood Basalt Data, American Geophysical Union Meeting, San Francisco.
36. C. Chen, J. Landis, J. Donoghue, B. Bostick, M. Sharma (2005) Influence of Black Shale Weathering on Riverine Osmium Isotopes: Examples from the Orinoco, American Geophysical Union Meeting, San Francisco.
37. K. Turekian, M. Sharma, G. Williams (2005) Transport of osmium through an estuary (Long Island Sound) using an anthropogenic isotopic signal, American Geophysical Union Meeting, San Francisco.
38. X. Feng, M. Sharma, J. Landis, E. Posmentier, W. McDowell (2005) Strontium isotopes evolution of groundwater in a floodplain, Rio Icacos, Luquillo Experimental Forest, Puerto Rico, American Geophysical Union Meeting, San Francisco.

MUKUL SHARMA

39. M. Sharma and C. Oze (2006) Synthesis of H₂ on Terrestrial Planetary Surfaces. Spring AGU.
40. R. Andreasen and M. Sharma (2006) Solar nebula heterogeneity in p-process Sm and Nd isotopes. Goldschmidt, Australia.
41. C. Oze and M. Sharma (2006) Serpentinization and abiogenic production of H₂ in planetary surfaces. GSA Philadelphia.
42. M. Sharma, R. Andreasen, K. V. Subbarao, and Ole Stecher (2006) Where on Earth is the enriched hidden reservoir? Fall AGU.
43. R. Ramirez, P. Sedwick, M. Sharma (2006) An Eolian Source of Non-Radiogenic Osmium to Surface Waters of the Sargasso Sea. Fall AGU.
44. D. Zylberberg, S. Goldstein, M. Sharma (2006) A 100ky record of the Osmium Isotopic Composition of Seawater. Fall AGU.