
Curriculum Vitae-Basak

CHANDRANATH BASAK

105 Comer Building

Lamont-Doherty Earth Observatory

61 Route 9W, P.O. Box 1000, Palisades, NY 10964

Email: cbasak@ldeo.columbia.edu; Office: +1 845-365-8647

SUMMARY

- **Research experience:** Over 9 years of experience in using nontraditional isotopes (Sr, Pb, and Nd) and trace element geochemistry. Current research projects include (i) reconstructing past and present deep ocean circulation, (ii) understanding trace element distribution and cycling in marine environment, and (iii) modeling the fate of particle reactive elements (Protactinium (Pa) and Thorium (Th)) in modern ocean using Transport Matrix Method (TMM).
- **Technical skill:** Extensive experience with Multi-Collector Mass Spectrometer (MC-ICPMS), Thermal Ionization Mass Spectrometer (TIMS), and Inductively Coupled Mass Spectrometer (ICP-MS). Highly familiar with clean lab environment, chromatographic chemical separation.
- **Teaching experience:** The Ocean and Global Climate Change, Introduction to Oceanography lab, Introductory Geology lab, Petrology and Structural Geology lab.
- **Funding:** Completed/current projects funded through: Geological Society of America ((\$1,650; PI: Basak) and Lamont Climate Center (\$10,000; PI: Basak).
- **Verbal and written communication skills:** Over the years participated in numerous national/international conferences. Delivered several oral presentations (both invited and regular oral presentation at conference). 11 published peer-reviewed articles. Out of the 5 lead authored peer reviewed journal articles 2 are in *Nature Geoscience*. Co-author of 2 journal articles published in *Nature Geoscience* and *Nature Communications*.
- **Service:** Serves as a reviewer to multiple peer-reviewed journals and funding agencies such as National Science Foundation and United States-Israel Binational Science Foundation.

APPOINTMENTS

- Post-doctoral Research Scientist (Summer 2014 - Present) Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY (Mentor: Dr. Robert Anderson)
- Post-doctoral Fellow (Fall 2011- Fall 2013) Max Planck Research Group - Marine Isotope Geochemistry at Carl von Ossietzky University-Institute for Chemistry and Biology of the Marine Environment (ICBM), Germany (Mentor: Dr. Katharina Pahnke)

EDUCATION

- Ph. D. (Fall 2006- Spring 2011) University of Florida, Gainesville, FL (Advisor: Dr. Ellen E. Martin)
- M. S. (Fall 2004- Spring 2006) Indiana State University, Terra Haute, IN (Advisor: Dr. Anthony E. Rathburn)
- M. Sc. (Applied Geology) (Fall 2002-Summer 2004) Jadavpur University, India.
- B. Sc. (Fall 1999-Summer 2002) Presidency College, University of Calcutta, India. Major: Geology (Hons), Minor: Chemistry and Mathematics

Curriculum Vitae-Basak

RESEARCH EXPERIENCE

- **Post-doctoral Research:** Reconstructing past and present water mass structure in the South Pacific.
- **Ph.D. Dissertation:** Deep ocean circulation and continental weathering regimes during climate transitions (last deglaciation and Eocene-Oligocene) using Sr, Nd, and Pb isotopes in sedimentary archives.
- **M.S. (US) Thesis:** Stable isotopic and elemental geochemistry of benthic foraminifera from multiple hydrographic regimes as environmental indicators.
- **M.Sc. (India) Thesis:** Major element mobility during metamorphism of a Barrovian sequence; test from Eastern Himalaya.

PUBLICATIONS

- Horikawa K., Martin E. E., **Basak C.**, Onodera J., Osamu Seki, Sakamoto T., Ikehara M., Sakai S., Kawamura K., 2015. Pliocene climate cooling enhanced by flow of low salinity Bering Sea water to the Arctic Ocean. *Nature Communications*, **6**.
- **Basak**, C., Pahnke, K., Frank, M., Lamy, F., Gersonde, R., 2015. Neodymium isotopic characterization of Ross Sea Bottom Water and its advection through the southern South Pacific. *Earth. Planet. Sci. Lett.* 419, 211-221.
- **Basak**, C., and Martin, E. E., 2013. Antarctic weathering and carbonate compensation at the Eocene-Oligocene transition. *Nature Geoscience*, 6(2): 121-124.
- van de Flierdt T., Pahnke K., and GEOTRACES **intercalibration participants**, 2012. GEOTRACES intercalibration of neodymium isotopes and rare earth elements in seawater and marine particulates – Part 1: international intercomparison. *Limnology and Oceanography: Methods*, 10, 234-251.
- MacLeod, K.G., Isaza Londono, C., Martin, E.E., Jimenez Berrocoso, A., and **Basak**, C., 2011. Changes in North Atlantic circulation at the end of the Cretaceous greenhouse interval. *Nature Geoscience*, 4(11), 779-782.
- **Basak C.**, Martin E. E., and Kamenov, G. D., 2011. Seawater Pb isotopes extracted from Cenozoic marine sediments. *Chemical Geology*, 286, 94–108.
- **Basak**, C., Martin, E.E., Horikawa, K., and Marchitto, T.M., 2010. Southern Ocean source of ¹⁴C-depleted carbon in the North Pacific Ocean during the last deglaciation. *Nature Geoscience*, 3(11): 770-773.
- Jiménez Berrocoso, A., MacLeod K.G., Martin, E.E., Bourbon, E., Isaza-Londoño, and **Basak**, C., 2010. Nutrient trapping during Late Cretaceous organic-rich shale deposition in the tropical North Atlantic. *Geology* 38, 1111-1114.
- Martin, E.E., Blair, S.W., Kamenov, G.D., Scher, H.D., Bourbon, E., **Basak**, C. and Newkirk, D.N., 2010. Extraction of Nd isotopes from bulk deep sea sediments for paleoceanographic studies on Cenozoic time scales. *Chemical Geology*, 269(3-4): 414-431.
- Dekov V. M., Cuadros J., Kamenov G. D., Weiss D., Arnold T., **Basak C.**, and Rochette P., 2010. Metalliferous sediments from the H.M.S. Challenger voyage (1872-1876). *Geochimica et Cosmochimica Acta* 74(17), 5019-5038.
- **Basak**, C., Rathburn, A.E., Pérez, M.E., Martin, J.B., Kluesner, J.W., Levin, L.A., De Deckker, P., Gieskes, J.M. and Abriani, M., 2009. Carbon and oxygen isotope geochemistry of live

Curriculum Vitae-Basak

(stained) benthic foraminifera from the Aleutian Margin and the Southern Australian Margin. *Marine Micropaleontology*, 70(3-4): 89-101.

Manuscripts in preparation:

- **Basak, C.**, Fröllje, H., Pahnke, K., Gersonde, R., Lamy, F., Benz, V., Anderson, R.F., Enhanced vertical mixing caused deep de-stratification during the last deglaciation. (*in prep.*)
- Fröllje, H., Pahnke, K., **Basak, C.**, Ullermann, J., Lamy, F., Gersonde, R., Variable glacial-interglacial Southern Ocean deep-water mixing over the last 140 ka traced by neodymium isotopes. (*in prep.*)

PUBLISHED ABSTRACTS AND PRESENTATIONS (SELECTED)

- Fröllje, H., **Basak, C.**, Lamy, F., Gersonde, R., Ullermann, J., and Pahnke, K., 2015. Changes in the South Pacific deep water Nd isotope composition over the last 140 ka. European Geophysical Union General Assembly 2015, Vienna, Austria.
- **Basak, C.**, Pahnke, K., Fröllje, H., Gersonde, R., Lamy, F., Benz, V., and Anderson, R. F., 2013. South Pacific Deep Circulation Linked to Climate Variations During the Last Deglaciation. International Conference of Paleoceanography 11, Sitges, Spain.
- **Basak, C.** and Pahnke, K., 2012. South Pacific Water Mass Structure From Nd Isotopes: Present And Past. Fall meeting of American Geophysical Union, San Francisco, USA.
- Martin, E. E., Fenn, C., **Basak, C.**, 2012. Enhanced Continental Weathering on Antarctica During the Mid Miocene Climatic Optima Based on Pb Isotopes. Fall meeting of American Geophysical Union, San Francisco, USA.
- **Basak, C.** and Pahnke, K., 2012. Bottom water changes in the South Pacific over the last 30 Ka documented by Nd isotopes. Goldschmidt Conference Abstract 2012, Montreal, Canada.
- Pahnke, K., **Basak, C.**, and Gersonde, R., 2012. Neodymium Isotopic Composition of South Pacific Bottom Water. Goldschmidt Conference Abstract 2012, Montreal, Canada.
- **Basak, C.** and Martin, E.E., 2011. Provenance of marine detrital fractions during rapid ice growth at the Eocene-Oligocene Transition (EOT). Fall meeting of American Geophysical Union, San Francisco, USA.
- Pahnke, K., **Basak, C.**, Martin, E. E. and Gersonde, R., 2011. Neodymium Isotope Ratios in Seawater and Sediments from the Pacific Sector of the Southern Ocean. Geophysical Research Abstracts Vol. 13, EGU2011-14223, 2011 EGU General Assembly 2011.
- **Basak, C.** and Martin, E.E., 2010. Weathering History of Antarctica during the Eocene-Oligocene transition. International Conference of Paleoceanography 10, La Jolla, San Diego, USA.
- **Basak, C.** and Martin, E.E., 2010. Extraction and reliability of Pb isotopes derived from Fe-Mn bearing phases in deep marine sediments, *Geochimica et Cosmochimica acta*, 74(12-1), a57-a57
- **Basak, C.** and Martin, E.E., 2009. Weathering Regimes at the Eocene-Oligocene Boundary Using Pb Isotopes from Kerguelen Plateau, *EOS Trans. AGU*.
- **Basak, C.**, Martin, E.E. and Marchitto, T.M., 2008. Nd Isotopic Evidence of Deglacial Antarctic Intermediate Water in the North Pacific. *Eos Trans. AGU* 85(53), Fall Meet. Suppl., Abstract PP23A-1468.
- **Basak, C.** and Martin, E.E. 2007. Pb Isotopes from Paleogene Fe-Mn Oxide Coatings from the Southern Ocean as a Proxy for Deep Water Circulation and Continental Weathering. *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract PP11A-0223.
- **Basak, C.**, Rathburn, A. E., De Deckker, P., Eggins, S.M., Kluesner, J., Perez, E., and Gieskers, J. M., 2005. The ecology and geochemistry of benthic foraminifera from the Venice lagoon, Italy. December 2005, Fall meeting of American Geophysical Union, CA.

Curriculum Vitae-Basak

- **Basak, C.**, Rathburn, A. E., De Deckker, P., Eggins, S. M., Kluesner, J., Perez E., and Gieskes, J. M. Benthic foraminifera as an environmental indicator: A study from the Venice lagoon, Italy. November 2005: 16th Annual Argonne Symposium and CSUI conference, Chicago Illinois.

TEACHING EXPERIENCE

- Spring 2011 Teaching Assistant, *The Oceans and Global Climate Change*, University of Florida, Gainesville, Florida. Responsibilities: grading and occasional lecturing.
- Fall 2008 Teaching Assistant, *Introduction to Oceanography Lab*, University of Florida, Gainesville, Florida. Responsibilities: grading and occasional lecturing.
- Fall 2006 Teaching Assistant, *Sedimentary Geology Lab*, University of Florida, Gainesville, Florida. Responsibilities: Lab design, instruction, grading.
- Fall 2004-
Spring 2006 Teaching Assistant, *Introductory Geology lab*, Indiana State University, Terre Haute, Indiana. Responsibilities: Lab design, instruction, grading.
- Spring 2005 Teaching Assistant, *Petrology and Structural Geology Lab*, Indiana State University, Terre Haute, Indiana. Responsibilities: Lab design, training in methodologies, grading.

INSTRUMENTAL AND LABORATORY EXPERIENCE

- Operated Nu-plasma and Neptune plus MC-ICPMS and Thermo Element II ICP-MS to measure Nd, Sr, and Pb isotopes and elemental concentrations almost on a daily basis.
- Operated TIMS (VG Sector 54 Thermal Ionization Mass Spectrometer) to measure Sr, and Nd isotope analyses.
- Heavily involved in the lab building process (Max-Planck marine isotope geochemistry group, Germany), ranging from smooth operation of the sample preparation laboratory, setting up chromatographic columns for elemental separation as part of sample preparation for isotope analyses, to writing/programming mass spectrometer methods for isotope analyses using the newly acquired Neptune plus MC-ICPMS.
- Guided and trained two graduate students as well as assisted the laboratory technician in day-to-day operation of the multi-collector mass spectrometer.

AWARDS, GRANTS, AND SCHOLARSHIPS

- Spring 2015 Lamont Climate Center grant (title: *Oxygen Minimum Zone fluctuation in the Arabian Sea during abrupt climate change events*, \$10,000.00)
- Spring 2011 John Ridge Award: Outstanding Graduate Student in academic excellence, Dept. of Geological Sciences, University of Florida (\$200)
- Spring 2011 McLaughlin Dissertation Fellowship, University of Florida (\$5000)
- Fall 2010 Travel grant, International Conference of Paleoceanography 10 (\$1000)
Travel grant from Office of Vice President of Research, University of Florida (\$300)
- Summer 2010 Goldschmidt 2010 Travel Grant (\$1000)
- Spring 2010 Geological Society of America Student Research Grant (\$1650)
Research grant from Dept. of Geological Sciences, University of Florida (\$1000)

Curriculum Vitae-Basak

- Fall 2009 Student travel grant, Graduate Student Council, University of Florida (\$250)
- Fall 2008 Student travel grant, Dept. of Geological Sciences, University of Florida (\$250)
- Fall 2007
- Fall 2006 Grinter Fellowship, University of Florida, Gainesville, Florida (\$3000)
- Spring 2006 Second place speaker award, Annual Research Showcase, Indiana State University, Terre Haute, Indiana
- Fall 2005 Student Travel Grant, American Geophysical Union (\$500)
- Fall 1997 Certificate of Merit Award under National Scholarship Scheme for the year 1997-1998 by Government of India

WORKSHOPS

- Spring 2013 Marine Geoscience Leadership Symposium, Washington DC, March 11-15, 2013.
- Summer 2012 US GEOTRACES Arctic Implementation and cruise planning meeting, National Science Foundation, June 13-15, 2012
- Summer 2012 Are your GEOTRACES data reliable?, Geel, IRMM, Belgium, May 29-31, 2012
- Spring 2011 Engaging Early Career Scientists in Future Scientific Ocean Drilling, College Station, TX, March 31 – April 1, 2011
- Fall 2010 US Arctic GEOTRACES planning Workshop, Washington DC, September 29 – October 1, 2010
- Fall 2010 Mini Symposium on Ocean Drilling, 10th International Conference on Paleoceanography, San Diego, August 29, 2010
- Summer 2009 Preparing for an Academic Career in the Geosciences, On the Cutting edge, University of Nevada, Las Vegas, NV, July 16-19, 2009
- Summer 2005 Nominated and selected for the Summer Institute for the International Teaching Assistants at the Center Of Teaching And Learning, Indiana State University, Terre Haute, Indiana

RESEARCH TALKS

- Summer 2015 Deep Ocean Circulation And Climate: A Nd Isotope Study From The South Pacific. Arizona State University, Tempe, AZ.
- Summer 2015 South Pacific Deep Circulation and Climate: present and past. Lamont Doherty Earth Observatory, Palisades, NY.
- Spring 2015 Story of Past Ocean Circulation as told by fossil fish teeth. City College of New York, NY.
- Fall 2012 South Pacific Water Mass Structure From Nd Isotopes: Present and Past. San Francisco, CA.
- Summer 2012 Bottom Water Changes in the South Pacific Over the Last 30 ka Documented by Nd Isotopes. Goldschmidt Conference, Montreal, Canada.
- Fall 2011 Continental Antarctic Weathering Regimes During the Eocene-Oligocene Transition: Using Nd, and Pb Isotopes in Sedimentary Archives. University of Oldenburg, Oldenburg, Germany.
- Fall 2010 Southern Source of Deglacial Old Carbon in the Tropical North Pacific Based on Nd Isotopes. University of Florida, Gainesville, FL.

Curriculum Vitae-Basak

RESEARCH CRUISES

- Summer 2011 Selected participant in the UNOLS Early Career Investigator Oceanographic Research Cruise Training Program. Involved in water sampling, sediment coring, and plankton tows.
- Summer 2007 Invited participant on a week-long research cruise onboard R/V Atlantis off Monterey Bay, CA. Involved in water sample collection and preservation for stable isotope analyses.
- Fall 2005 Invited participant on a twenty-four hour research cruise onboard R/V Robert Gordon Sproul off San Diego, CA. Involved in water and sediment sample collection and plankton tow operation.
- Fall 2005 Invited participant on a six-day research cruise onboard R/V Roger Revelle. Involved in dredging submarine rock samples and mapping of the sea floor off the coast of California.

PROFESSIONAL MEMBERSHIP AND SERVICE

- American Geophysical Union (since 2005)
- Geochemical Society (since 2010)
- Journal reviewer for *Geology*, *Earth and Planetary Science Letters*, *Geochimica Cosmochimica Acta*, *Marine Geology*, *Chemical Geology*, *G³: Geochemistry*, *Geophysics*, *Geosystems*.
- Proposal reviewer for *National Science Foundation*, and *United States-Israel Binational Science Foundation*.
- AGU session organizer (2012)