

**Trina Bose**  
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**Research Interests:** Paleoclimate, Isotope dendro-climatology, Integrated interpretation of Geo-scientific datasets, Climate change, Climate Processes, Isotope Geochemistry, Chemical processing for compound specific isotopic measurements in wood and soil, EA/GB-IRMS, Geophysical Instrumentation and Signal Processing, Computer Programming, Environmental pollution etc.

**Educational Qualifications:**

- PhD, Department of Atmospheric and Space Sciences, Savitribai Phule Pune University ([SPPU](#))  
Degree awarded on 11-08-2015.  
Place of Research: Indian Institute of Tropical Meteorology ([IITM](#))  
Title: Long term reconstruction of climatic parameters using isotopic proxies from dated tree ring samples from western Himalayas.
- CSIR – NET in Earth, Atmospheric, Ocean and Planetary Sciences passed with 001/102 rank in exam given on June 20, 2010
- M.Sc Geophysics from Indian Institute of Technology - Kharagpur ([IIT-KGP](#)) with 7.64/10 CGPA; passing year 2006.
- B.Sc (Physics Honors) from Banaras Hindu University ([BHU](#)) year 2001 with First class.
- 10+2 from Central Hindu Girls School ([CHGS](#)) year 1997 with First class.
- 10th from Central Hindu Girls School ([CHGS](#)), Varanasi, India, year 1995 with First class.

**Computational Expertise:**

|                  |                              |                   |            |
|------------------|------------------------------|-------------------|------------|
| Microsoft Office | Fortran                      | Latex             | Origin Lab |
| GRADS            | Climate Data Operators (CDO) | C                 | Ferret     |
| MATLAB           | Linux                        | Neural Networking | ISODAT     |

**Experiences:**

- Process based modeling of tree ring cellulose oxygen isotope data to reconstruct air temperature without any statistical calibration.
- Process based modeling of tree ring cellulose oxygen isotope data to reconstruct soil water oxygen isotopes for 100+ years showing variation of soil moisture content in the 20<sup>th</sup> century.
- Process based modeling of tree ring cellulose carbon isotope data to reconstruct partial pressure of carbon dioxide in the tropical atmosphere for 50+ years.
- Carbon and oxygen isotope measurement of tree ring cellulose (500+ samples)
- Installed, parameterized and standardized the oxygen isotope measurement using an Element Analyzer with an Isotope Ratio Mass Spectrometer in IITM, Pune
- Separation and chemical processing of tree ring samples from western Himalaya to produce alpha cellulose
- Designed and implemented a micro-processing unit for chemical processing of small samples with minimum mass loss
- Integrated data processing and interpretation of Geophysical data
- Radiometric survey of Lonar impact crater to separate the ejecta from the bedrock
- Showed similarity of periodicities in impact cratering events to the 400 kyr Milankovitch cycle

- **Publications:**

*Research Papers in Referred Journals:*

- Trina Bose, Saikat Sengupta, Supriyo Chakraborty, Hemant Borgaonkar; Reconstruction of soil water oxygen isotope values from tree ring cellulose and its implications for paleoclimate studies; Quaternary International, Volume 425, 15 December 2016, Pages 387-398, ISSN 1040-6182, <http://dx.doi.org/10.1016/j.quaint.2016.07.052>.
- Trina Bose, Supriyo Chakraborty, Hemant Borgaonkar, Saikat Sengupta and R. Ramesh; Estimation of Past Atmospheric Carbon dioxide levels using tree ring  $\delta^{13}\text{C}$ ; Vol. 107, No. 6 Current Science; <http://www.currentscience.ac.in/Volumes/107/06/0971.pdf>, 25 September 2014
- S. Sengupta, Anant Parekh, S. Chakraborty, K. Ravi Kumar, and T. Bose; Vertical variation of oxygen isotope in Bay of Bengal and its relationships with water masses; Journal of Geophysical Research: Oceans, VOL. 118, 1–14, doi:10.1002/2013JC008973, 2013
- T. Bose, S. Misra, S. Chakraborty, and K. Reddy; Gamma ( $\gamma$ )-Ray Activity as a Tool for Identification of Hidden Ejecta Deposits around Impact Crater on Basaltic Target: Example from Lonar Crater, India; Earth, Moon, and Planets, 1-16, doi: 10.1007/s11038-013-9422-6, 2013
- Trina Bose, Ajoy K. Bhaumik and Saumitra Misra; Meteoritic Impacts and Climatic Changes in Pliocene-Pleistocene Epoch; Earth Moon and Planets, 101:141-151, DOI 10.1007/s11038-007-9190-2, 2007

*Papers in Conference/Symposia:*

- Trina Bose, Supriyo Chakraborty, Saikat Sengupta, Hemant Borgaonkar; Application of Biochemical modeling in Paleoclimatic reconstructions from tree ring cellulose isotope data; Abstract ID: 34449, Paper Number: PP22A-052015, Joint Assembly AGU, May 2-15, Montreal, Canada.
- Trina Bose ; Analyzing Monthly Relative Humidity, Temperature and Precipitation data for Monsoon Rainfall reconstructions; Workshop on Southwest Monsoon-2012 understanding of summer monsoon over Indian subcontinent; Pune, Feb. 19-20, 2013.
- Trina Bose, Supriyo Chakraborty and Hemant Borgaonkar; Carbon dioxide reconstruction from Tree-ring cellulose; Second American Dendrochronology Conference, 13-17 May 2013, Tucson, Arizona, USA. Accepted for Oral Presentation
- Trina Bose, Supriyo Chakraborty, Hemant Borgaonkar; Quantifying effect of increasing  $\text{pCO}_2$  of air on Net Isotopic fractionation during Tree-ring cellulose deposition in  $\text{C}_3$  plants; Geophysical Research Abstracts Vol. 15, EGU2013-2297, 2013 EGU General Assembly 2013 © Author(s) 2013. CC Attribution 3.0 License. Oral Presentation
- Trina Bose, Supriyo Chakraborty, Hemant Borgaonkar, Saikat Sengupta; “Studying Carbon fixation in natural  $\text{C}_3$  plants using tree ring  $\delta^{13}\text{C}$  data during 1978-2005”; Session: Past as a mirror for future; International conference on "Opportunities and Challenges in Monsoon Prediction in a Changing Climate" (OCHAMP-2012), Pune, India, 21-25 February 2012. Secured Best poster presentation award for the session.
- T. Bose, S. Misra, K. S. Banerjee, S. Chakraborty, H. Newsom and K. Reddy; “Gamma ( $\gamma$ ) – Ray Mapping of Ejecta around Lonar Asteroid Impact Crater, India.” by 41<sup>st</sup> Lunar and Planetary Science Conference, 1549, 2010
- S. Misra, T. Bose, H.E. Newsom and D. Sengupta, “Geochemistry of Impact Ejecta from Lonar Crater, India – More Clues for Crater Evolution” by Lunar and Planetary Science XXXVII, 2123, 2006.

### *Books edited and chapters in books*

- In “Global Warming and Climate Change”, Editors: S. Chakraborty, Trina Bose; DST Sponsored SERC School on Global Warming and Climate Change, December 1-21, 2010
  - Indian Monsoon in a Changing Climate: An overview; Lecture: B.N. Goswami; Text: Trina Bose
  - The Impact of Climate Change on India’s Monsoonal Climate; Lecture: K. Krishna Kumar; Text: Trina Bose
  - Responding to Climate Change; Lecture: A. Patwardhan, IIT-Mumbai; Text: Trina Bose

### **Conferences/Workshops:**

- AGU 2015 Joint Assembly, 4-7 May 2015, Palais des congrès de Montreal, in Montreal, Canada
- European Geophysical Union General Assembly 2013, Vienna, Austria, 7-12 April 2013
- National Workshop on Data Assimilation, Pune, India, 3-10 Oct, 2012.
- International conference on "Opportunities and Challenges in Monsoon Prediction in a Changing Climate" (OCHAMP-2012), Pune, India, 21-25 February 2012; Session: Past as a mirror for future; Secured Best poster presentation award for the session
- SERC School on Global Warming and Climate Change, IITM, during Dec 2010. Edited the official Book for the School.
- HLS India Workshop on modern Well logging methods during Feb 2007

### **Research or Work Experience:**

- Scientist B in Birbal Sahni Institute of Paleosciences, Lucknow, India from March, 2017.
- Research Associate in Center for Earth Sciences, Indian Institute of Science, Bengaluru from April 2016 to July, 2016.
- Post-Doctoral Fellow in Geosciences Division, Physical Research Laboratory, Ahmedabad during Dec 2014 – March 2016
- Research Fellow working in Isotope Geo/Biochemistry in the Indian Institute of Tropical Meteorology, Pune, India during Dec 2008 – Nov 2014
- PhD Student in the Department of Earth and Environmental Sciences, University of Rochester during Sept 2007-Aug 2008.
- Geophysicist for Integrated Geophysical Data interpretation in Assam Company Limited, 52, Chowringhee Road, Kolkata, India, during Dec 2006 to Sept 2007
- Exposure to sample preparation and data acquisition in ICP-MS analysis of trace elements in powdered rock samples, in National Facility, National Geophysical Research Center, Hyderabad-500007, Andhra Pradesh, India during Dec 2005.
- Summer training in Data Processing of Geomagnetic ground data through Neural Networking during June-July 2005 in National Geophysical Research Center, Hyderabad-500007, Andhra Pradesh, India.

### **Field Experience:**

- Deep water sampling cruise in Northern Bay of Bengal on Sagar Kanya, 9<sup>th</sup> August to 8<sup>th</sup> July, 2012
- Speleothem reconnaissance study in Bastar, Chhattisgarh, India during Jan, 2010

- Structural study of the Plateau, Valley, Ridge and Blue Ridge provinces of the Central Appalachians in New York, Pennsylvania, Maryland, West Virginia and Virginia states, USA
- Sedimentary and Stratigraphic study of Acadian basinal deposits and Catskill mountains in New York State, USA
- Seismic Surveying in Lower Assam and Nagaland, India
- Geochemical sampling and radiometric surveying in Lonar, Maharashtra, India
- Radiometric prospecting in the Jadugoda Uranium mine area, Jharkhand, India
- Gravity and Magnetic survey in Anugul District, Orissa, India
- Seismic Survey training around Kharagpur, West Bengal, India
- Electrical Resistivity, Electromagnetic and Radioactivity survey in Noyapara District, Orissa, India
- Vindhyan Super group-structural, palaeontological and mineralogical study in Son valley, Mirzapur and Sonbharda districts, U.P. , India

#### **Teaching experience:**

- “Long term climate change, Greenhouse effect and global warming, Paleoclimatology, and future climate scenario” in Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), affiliated to the United Nations training in Satellite Meteorology and Global Climate (SATMET) - 9 course (Module-II)
- Tutoring undergraduate Level Students in Physics, Mathematics and Chemistry during 2007-2008.
- As academic consultant with Education One, B-45, Arjun Palace, Greater Kailash-1, New Delhi, from Oct. 2003 to August 2004. Responsibilities included academic counseling in problem areas, writing and editing specifically designed study materials and assignments in Science subjects, and general educational management.
- As project manager/learning facilitator in a “development in educational methods” project under NEEV (Network of Enterprising Educational Ventures-a NGO), C-31/c, Alkanada, New Delhi, from Oct. 2002 to May 2003. Responsibilities included general management of the project and developing innovative methods of teaching in science, in addition to parent-student counseling.
- Classroom teaching up to 10+2 in Physics and Chemistry
- Library cataloging and maintenance.
- Career counseling.

#### **Additional Qualifications:**

- GRE general test with 1310 score in verbal and quantitative areas with 4.0 in analytical on 2 November 2005.
- TOEFL with score 277 on 8 November 2005.
- IELTS with 7.0 GPA on 20 Dec 2001.