

# Manasij Santra

Postdoctoral Fellow, Institute for Geophysics, University of Texas  
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## EDUCATION

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**Doctor of Philosophy in Geological Sciences** May 2012

University of Texas at Austin, Austin, Texas

*Dissertation title:* "Patterns of Infill and Basin-Scale Architecture: Tye Forearc Basin, and Observation from a Segment of New Jersey Passive Margin"

**Master of Science in Applied Geology** May 2001

Indian Institute of Technology, Kharagpur, India

*Thesis title:* "Structures and Textures in and Around Koraput Igneous Complex: The Case against Syn- to Post-Tectonic Intrusion"

**Bachelor of Science in Geology** July 1999

Presidency College, Kolkata, India

## RESEARCH INTERESTS

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- Natural gas hydrate systems.
- Deepwater depositional processes and architecture of deepwater deposits.
- Basin-margin clinoform shape and stacking pattern.
- Stratigraphy of clastic shelf margins.
- Stratigraphy of basins under influence of halokinetic movement.
- Reservoir modeling.
- Basin modeling.

## RESEARCH EXPERIENCE

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**Postdoctoral Fellow** 2016 - Present

*Institute for Geophysics, The University of Texas at Austin*

- Identifying and characterizing gas hydrate bearing deep water reservoir using subsurface data (seismic, well log, and core).
- Investigating formation, behavior, and mode of occurrence of natural gas hydrate as a new energy source using subsurface data, samples and experimental data.
- Basin modeling (with special focus on hydrate systems)
- Contributing in planning and execution of offshore expeditions to collect naturally occurring gas hydrate bearing deep sea sediment samples in in situ condition, as part of a joint government-industry-academic project known as GOM<sup>2</sup>.

**Graduate Research Assistant** 2006-2012

*Department of Geological Sciences, University of Texas at Austin*

- Stratigraphic and sedimentological analysis of ancient sedimentary deposits to understand large-scale distribution of sediment from continental sediment source to deep sedimentary basins, a range of factors controlling such distribution, and architecture as well as organization of such components as continental, shoreline-, shelf-, slope-, and basin floor deposits, focusing on Early Eocene Tye Forearc Basin in Oregon
- High resolution seismic stratigraphy of a Late Pleistocene sediment wedge on New Jersey shelf

**Graduate Student**

1999-2001

*Department of Geology & Geophysics, Indian Institute of Technology, Kharagpur*

- Structural mapping and microstructure analysis of a deformed alkaline complex leading to the understanding of relative time of intrusion with respect to major deformation events, Eastern Ghats Mobile Belt, India

**PROFESSIONAL EXPERIENCE (PETROLEUM EXPLORATION & FIELD DEVELOPMENT)****Petrographer**

2015-2016

*O. R. C. Inc., Houston, Texas*

- Contributed to a reservoir quality prediction project as a consultant for a major international E&P company.
- Conducted petrographic analysis of clastic reservoir core samples from Gulf of Mexico, West Africa, and Brunei.
- Prepared sedimentological description/interpretation of sandstone reservoirs in relation with diagenetic history.

**Geologist/Senior Geologist**

2012-2015

*ConocoPhillips, Houston, Texas*

- Conducted regional play risk assessment and generated regional-scale play maps from sedimentological data and basin-modeling results, impacting several lease acquisitions in Western Gulf of Mexico.
- Identified and matured three sub-salt Paleogene and Miocene leads in western Gulf of Mexico through detailed stratigraphic and structural interpretation, and built simple static models.
- Performed resource estimation and risk estimation for five exploration prospects/leads.
- Supported/monitored two 3D seismic imaging projects focused on sub-salt depth imaging.

**Graduate Intern**

Summer 2008

*ExxonMobil Development Company, Houston, Texas*

- Analyzed static and dynamic reservoir connectivity in geocellular models for a deepwater field under development (in West Africa), using streamline simulation and other tools.

**Senior Geoscientist**

2004-2006

*Reliance Industries Limited, Oil and Gas Division, Mumbai, India*

- Characterized a gas charged slope-channel complex using geophysical, petrophysical and core data for gas field development in Krishna Godavari Basin, India
- Generated detailed multi-layer geocellular model for a deepwater channel reservoir system and upscaled the model for simulation for development of a multi-TCF gas field
- Provided sedimentological/ stratigraphic input for two seismic inversion projects and monitored/evaluated inversion results.
- Worked with a multi-disciplinary team to generate a development plan for a deepwater gas field.

**Geoscientist**

2001-2004

*Reliance Industries Limited, Oil and Gas Division, Mumbai, India*

- Explored offshore Krishna Godavari Basin, India leading to a major gas discovery
- Performed preliminary resource estimation and identified exploration well locations.
- Conducted detailed mapping and visualization of channel reservoir using seismic attributes in a 3D visualization environment.
- Provided geological support at well site for a deepwater exploration well and monitored/supported processing of on-shore and off-shore 3D seismic data.

## TEACHING EXPERIENCE

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### Teaching Assistant, Sedimentary Rocks

Fall 2009, Fall 2010

*Department of Geological Sciences, University of Texas at Austin*

- Conducted lectures and class activities in a laboratory environment on morphological aspects of sedimentary rocks, sedimentary processes, and stratigraphy, for 15-20 undergraduate students

### Teaching Assistant, Petroleum Basin Evaluation

Spring 2007, Spring 2008

*Department of Geological Sciences, University of Texas at Austin*

- Conducted lectures and class activities in a laboratory environment on all aspects of petroleum geology combining concepts of structural geology, stratigraphy, geochemistry and geophysics.
- Created and graded lab exercises and lab exams.

### Teaching Assistant, Petroleum Workstation

Fall 2006

*Department of Geological Sciences, University of Texas at Austin*

- Instructed a group of graduate students on concepts and applications of seismic exploration using industry standard software programs.
- Evaluated assignments.
- Created and maintained course website.

## FIELD AND OFFSHORE RESEARCH EXPERIENCE

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### UT-GOM2-1 Expedition for pressure coring of gas hydrate, Offshore Gulf of Mexico

May 2017

*Institute for Geophysics, University of Texas at Austin*

- As on board seismic scientist ensured accuracy of drilling location.
- Monitored drilling and coring process to understand and implement optimal coring procedure.
- Performed on board analysis of core, including facies analysis based on X-ray image and core logs.

### Field study in Tye Forearc Basin, Coast Range, Oregon

2007 - 2011

*Department of Geological Sciences, University of Texas at Austin*

- Conducted 200 days of fieldwork, recording and describing more than 500 outcrops, including extensive slope deposits, and basin floor deposits in Coast Range of Western Oregon.

### Gravity-coring expedition: New Jersey Shelf

August 2007

*Department of Geological Sciences, University of Texas at Austin*

- Participated in two weeks long coring expedition and collected sediment core from Quaternary deposits of New Jersey Shelf.

## PUBLICATIONS

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Gupta, S., Nanda, J., Mukherjee, S.K., Santra, M., 2005. Alkaline Magmatism versus Collision Tectonics in the Eastern Ghats Belt, India: Constraints from Structural Studies in the Koraput Complex. *Gondwana Research* 8, 403-419

Santra, M., Goff, J.A., Steel, R.J., Austin, J.A., Jr., 2013. Forced regressive and lowstand Hudson paleo-Delta system: Latest Pleistocene growth of the outer New Jersey shelf. *Marine Geology* 339, 57-70.

Santra, M., Steel, R.J., Olariu, C., Sweet, M.L., 2013. Stages of sedimentary prism development on a convergent Margin – Eocene Tye Forearc Basin, Coast Range, Oregon, USA. *Global and Planetary Change* 103, 207-231.

- Flemings, Peter B; Boswell, Ray; Collett, Timothy S; Cook, Ann E; Divins, David; Frye, Matthew; Guerin, Gilles; Goldberg, David S; Malinverno, Alberto; Meazell, Kevin; Morrison, Jamie; Pettigrew, Tom; Philips, Stephen C; Santra, Manasij; Sawyer, Derek E; Shedd, William; Thomas, Carla; You, Kehua, 2017. GOM2: Prospecting, Drilling and Sampling Coarse-Grained Hydrate Reservoirs in the Deepwater Gulf of Mexico. **Proceedings of 9th International Conference on Gas Hydrates, Denver.**
- Scott, E., Santra, M., Meazell, K., Flemings, P. B., 2017, Bottom current drift deposits in a Gulf of Mexico minibasin. **Gulf Coast Association of Geological Societies Transactions**, v. 67, p. 533-535.
- A. Portnov, A. E. Cook, M. Heidari, D. E. Sawyer, M. Santra, and M. Nikolinakou, Salt-driven evolution of a gas hydrate reservoir in Green Canyon, Gulf of Mexico, (*in press; preliminary version published online Ahead of Print 21 December 2018*): **AAPG Bulletin**, doi: 10.1306/10151818125.
- Santra, M., Flemings, P., Scott, E., Meazell, K., 2019. Evolution of Gas Hydrate Bearing Deepwater Channel-Levee System in Abyssal Gulf of Mexico. *Submitted to AAPG Bulletin - accepted*
- Meazell, K., Flemings, Santra, M., 2019. Silt-Rich Channel-Levee Hydrate Reservoirs of Green Canyon 955. *Submitted to AAPG Bulletin - under review*
- Thomas, C., Phillips, S, Flemings, P., Santra, M., Hammon, H., Collett, T., Cook, A., Pettigrew, T., Schultheiss, P., 2019. Pressure-Coring Operation in Expedition UT-GOM2-1, Green Canyon Block 955, Northern Gulf of Mexico. *Submitted to AAPG Bulletin - under review*
- Peter B. Flemings, Stephen C. Phillips, Ray Boswell, Timothy S. Collett, Ann E. Cook, Tiannong Dong, Matthew Frye, Gilles Guerin, David S. Goldberg, Melanie E. Holland, Junbong Jang, Kevin Meazell, Jamie Morrison, Joshua I. O'Connell, Tom Pettigrew, Ethan G. Petrou, Peter J. Polito, Alexey Portnov, Manasij Santra, Peter J. Schultheiss, Yongkoo Seol, William Shedd, Evan A. Solomon, Carla M. Thomas, William F. Waite, Kehua You, 2019. Concentrated hydrate in a deepwater Gulf of Mexico turbidite reservoir: initial results from the UT-GOM2-1 Hydrate Pressure Coring Expedition. *Submitted to AAPG Bulletin - under review*
- Portnov, A., Santra, M., Cook, A. E., Sawyer, D. E., 2019. The Jackalope gas hydrate system in the northeastern Gulf of Mexico. *Submitted to Marine and Petroleum Geology - under review*

## MANUSCRIPTS IN PREPARATION

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- Santra, M., Flemings, P., Heidari, M., You, K. Occurrence of Gas Hydrate in Fault-Compartmentalized Channel-Levee System, Green Canyon, Abyssal Gulf of Mexico. *Manuscript in preparation*
- Santra, M., Prokocki, E., Olariu, C., Mohrig, D., Flemings, P. B.,. Variability in Supercritical Bedforms in a Channel-Lobe Transition, Green Canyon, Abyssal Gulf of Mexico. *Manuscript in preparation*
- Santra, M., Steel, R.J., Olariu, C. Variability in sand-rich slope-channel deposits in Early Eocene Tyee Forearc Basin, Coast Range, Oregon. *Manuscript in preparation*

## PRESENTATIONS

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- Santra, M., Prokocki, E., Olariu, C., Mohrig, D., 2019. Inception, Growth and Demise of Supercritical Bedforms in a Channel-Lobe Transition, Green Canyon, Abyssal Gulf of Mexico. **AAPG annual convention and exhibition, San Antonio**
- Santra, M., Flemings, P. B., Heidari, M., 2018. Channel-levee hosted hydrate accumulation controlled by a faulted anticline: Green Canyon, Gulf of Mexico. **AGU Fall Meeting, Washington D.C.**

You, K., Flemings, P. B., Santra, M., 2018. Formation of Lithology Dependent Hydrate Distribution by Capillary Controlled Gas Flow Sourced from Faults. **AGU Fall Meeting, Washington D.C.**

Santra, M., Flemings, P.B., Scott, E., Meazell, K., 2018. Evolution of Gas Hydrate Bearing Deepwater Channel-Levee System in Green Canyon Area in Northern Gulf of Mexico. **Gordon Research Conference and Gordon Research Seminar on Natural Gas Hydrate Systems, Galveston**

Santra, M., Flemings, P.B., Scott, E., Meazell, K., Petrou, E., 2017. 3D Seismic Stratigraphic Analysis of Gas Hydrate Bearing Turbidite Channel-Overbank System in Northern Gulf of Mexico. **AGU Fall Meeting**

Santra, M., Steel, R.J., Sweet, M.L., 2012. Outcrop-scale slope channel architecture from Eocene Tye Forearc Basin, Oregon. **AAPG annual convention and exhibition, Long Beach**

Santra, M., Goff, J.A., Steel, R.J., 2011. Latest Pleistocene sediment wedge on the New Jersey outer continental shelf - Forced regressive paleo-Hudson delta?. **AGU fall meeting**

Santra, M., Steel, R.J., Sweet, M.L., 2011. Forearc sedimentation in Early to Middle Eocene Tye Basin, Coast Range, Oregon. **28th IAS Meeting of Sedimentology, Zaragoza, Spain**

Santra, M., Steel, R.J., Sweet, M.L., 2011. Shelf-slope sedimentary prism development in Eocene Tye Basin, Oregon. **AAPG annual convention and exhibition, Houston**

Santra, M., Steel, R.J., 2010. Complex clinofolds and shelf to basin floor sediment distribution patterns in the Eocene forearc Tye Basin, Coast Range, Oregon. **International Sedimentological Congress, Mendoza, Argentina**

Santra, M., Steel, R.J., 2010. Eocene Tye Forearc Basin, Oregon: outsize Greenhouse fans at the base of shelf-margin clinofolds. **Norwegian Petroleum Society Conference, Stavanger, Norway**

Santra, M., Steel, R.J., Sweet, M.L., 2010. Basin-Fill Geometry of Eocene Tye Basin - From Fluvial Deposits to Extensive Sand-Rich Basin Floor Fans. **AAPG annual convention and exhibition, New Orleans**

Santra, M., Steel, R.J., Sweet, M.L., 2009. Deep Water Fan complexes in a Forearc Basin - Eocene Tye Formation. **AAPG annual convention and exhibition, Denver**

Santra, M., Steel, R.J., Sweet, M.L., 2008. Slope channels and fan channels from Early to Middle Eocene strata of Coast Range, Oregon. **AAPG annual convention and exhibition, San Antonio**

Santra, M., Goff, J.A., Austin, J.A., Jr., Steel, R.J., 2007. CHIRP seismic reflection study of falling stage (forced regressive) sediment wedges on the New Jersey outer continental shelf. **AGU fall Meeting**

## FELLOWSHIPS AND GRANTS

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Harold J. Funkhouser Memorial Grant

2010

*American Association of Petroleum Geologists*

Gale White Fellowship

Spring, 2009

*Institute for Geophysics, University of Texas at Austin*

## PROFESSIONAL SERVICE

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### Reviewed Articles for Following Journals

- *IAS Special Publication 46*
- *AAPG Bulletin*
- *Journal of Earth Science Systems*
- *Current Science*
- *Marine and Petroleum Geology*
- *Interpretation*

**Judge: Outstanding Student Paper Award, AGU Fall Meeting (2017)**

**Discussion Leader**

*Gordon Research Seminar on Natural Gas Hydrate Systems (GRS), March 2018, Galveston, Texas (session: Gas Hydrate System Characterization)*

**Session Chair/ Primary Convener**

*Session: Geological and Geophysical Characterization of Gas Hydrate Bearing Reservoirs. AGU Fall Meeting, December 2018*

**MEMBERSHIP IN PROFESSIONAL ORGANISATIONS**

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*Member - American Geophysical Union*

*Associate Member - American Association of Petroleum Geologists*