

# Athma R. Bhandari

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## **Education**

- 2009 Ph.D. Civil/Geotechnical Engineering, University of Southampton, U.K.  
Dissertation: The mechanics of an unbonded locked sand at low effective stresses. 236 p.
- 2004 M.E. Civil Engineering, The University of Tokyo, Japan  
Thesis: Experimental and numerical studies of strain localization characteristics in rate-dependent solids. 84 p.
- 2000 B.E. Civil Engineering (with distinction), Tribhuvan University, Kathmandu, Nepal

## **Research and Professional Experience**

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|---------------------|---|
| 2015 Sep – Present  | Research Associate, Institute for Geophysics<br>The University of Texas at Austin, Austin                                       |
| 2014 Feb – 2015 Aug | Research Associate, Bureau of Economic Geology<br>The University of Texas at Austin, Austin                                     |
| 2012 Apr – 2014 Jan | Postdoctoral Fellow, Bureau of Economic Geology<br>The University of Texas at Austin, Austin                                    |
| 2010 Oct – 2012 Mar | Postdoctoral Research Fellow in Geomechanics<br>Faculty of Engineering and the Environment<br>University of Southampton, UK     |
| 2009 Oct – 2010 Sep | KTS Postdoctoral Research Fellow in Geomechanics<br>Faculty of Engineering and the Environment<br>University of Southampton, UK |
| 2004 Oct – 2005 Mar | Lecturer, Institute of Engineering<br>Tribhuvan University, Nepal   |
| 2001 Oct – 2002 Sep | Civil Engineer<br>Nepal Electricity Authority, Kathmandu, Nepal   |
| 2000 Oct – 2001 Sep | Lecturer, Advanced College of Engineering and Management<br>Tribhuvan University, Nepal   |

## **Areas of Expertise**

Measurement of mass transport in gas shales  
Geotechnical laboratory testing  
Digital-image-based deformation measurements  
Microstructure characterization of soils and rocks  
Constitutive and numerical modeling of geomaterials

## **Honors and Awards**

Knowledge Transfer Secondments (KTS) Fellowship, EPSRC, 2009 - 2010  
Overseas Research Students Award Scheme (ORSAS) Award, 2006 - 2009  
Research Scholarship at the University of Southampton, 2005 - 2009  
ADB—Japan Scholarship Program Scholarship, 2002 – 2004

## **Service**

UTIG Fellowship Committee, 2018 –  
Board of Directors, American Society of Nepalese Engineers, 2018 –

Session Primary Convener, Chair and OSPA Liaison, “Experimental Approaches to Fine-grained Nano-porous Reservoir Rocks” AGU Fall Meeting 2017

Judge for Outstanding Student Poster, AGU Fall Meeting, 2014, 2017

Article Reviewer

Journal of Petroleum Science and Engineering

Transport in Porous Media

Geotechnique

Canadian Geotechnical Journal

Applied Physics & Engineering Journal, Zhejiang University- Science A

ARMA 51<sup>st</sup> US Rock Mechanics / Geomechanics Symposium

6<sup>th</sup> Biot Conference on Poromechanics Conference

## **Professional Memberships**

American Geophysical Union (AGU), 2012 – present

American Society of Nepalese Engineers, 2018 – present

American Rock Mechanics Association (ARMA), 2016 – 2017

British Geotechnical Association (BGA), 2005 – 2015

International Society for Rock Mechanics (ISRM), 2005 – 2015

International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), 2005 – 2015

## **Publications**

Peer-reviewed Journal Articles:

- 1) **Bhandari, A. R.** et al., in review, Gas and Liquid Permeability Measurements in Wolfcamp Samples: Fuel
- 2) **Bhandari, A. R.**, Flemings, P. B., Hofmann, R., and Polito, P. J., 2018, Stress-dependent In-situ Gas Permeability in the Eagle Ford Shale: *Transport in Porous Media*, v. 123, no. 1, p. 1-20, <https://doi.org/10.1007/s11242-018-1021-6>.
- 3) Cronin, M. B., Flemings, P. B., **Bhandari, A. R.**, 2016, Dual-permeability microstratigraphy in the Barnett Shale: *Journal of Petroleum Science and Engineering*, v. 142, p. 119-128, doi: <https://doi.org/10.1016/j.petrol.2016.02.003>.
- 4) **Bhandari, A. R.**, Flemings, P. B., Polito, P. J., Cronin, M. B., and Bryant, S. L., 2015, Anisotropy and Stress Dependence of Permeability in the Barnett Shale: *Transport in Porous Media*, v. 108, no. 2, p. 393-411, <https://doi.org/10.1007/s11242-015-0482-0>.
- 5) Le Pen, L, **Bhandari, A. R.**, and Powrie, W., 2014, Sleeper end resistance of ballasted railway tracks: *Journal of Geotechnical and Geoenvironmental Engineering*, v. 140, no. 5, 14 p., [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0001088](https://doi.org/10.1061/(ASCE)GT.1943-5606.0001088).
- 6) **Bhandari, A. R.**, and Powrie, W., 2013, Behavior of an MBT waste in monotonic triaxial shear tests: *Waste Management*, v. 33, p. 881–891, doi: <https://dx.doi.org/10.1016/j.wasman.2012.11.009>.
- 7) **Bhandari, A. R.**, and Powrie, W., 2013, Strength and deformation characteristics of a locked sand at low effective stresses: *Granular Matter*, v. 15, p. 543-556, doi: <https://dx.doi.org/10.1007/s10035-013-0426-8>.
- 8) **Bhandari, A. R.**, Powrie, W., and Harkness, R. M., 2012, A digital image-based soil deformation measurement system for triaxial tests: *Geotechnical Testing Journal*, v. 35, no. 2, p. 209–226 doi: <https://dx.doi.org/10.1520/GTJ103821>.
- 9) **Bhandari, A. R.**, and Inoue, J., 2005, Experimental study of strain rate effects in strain localization characteristics of soft rocks: *Soils and Foundations (Japanese Geotechnical Society, Japan.)*, v. 45, no. 1, p. 125–140.
- 10) **Bhandari, A. R.**, and Inoue, J., 2005, Strain localization in soft rock—a typical rate dependent solid: experimental and numerical studies: *International Journal of Analytical and Numerical Methods in Geomechanics*, v. 29, p. 1087–1107.

Conference Articles:

- 11) **Bhandari, A. R.**, Flemings, P. B., and Polito, P. J., 2017, Permeability Behavior and the Effective Stress Law for a Partially Fractured Eagle Ford Shale Sample, in Proceedings of the Poromechanics VI, Paris, France, p. 1892 -1899.
- 12) **Bhandari, A. R.**, and Powrie, W., 2011, Behaviour of an MBT waste in triaxial tests, in Proceedings of the Fourth International Workshop Hydro-Physico-Mechanics of Landfills, Santander, Spain, April 27–28, 4 p., CD-ROM.
- 13) **Bhandari, A. R.**, and Inoue, J., 2004, Experimental observations of strain localization in soft rocks at different strain rates, in Proceedings of Sixth International Summer Symposium, JSCE, Saitama, Japan, July 31, p. 249–252.

**Contracts and Grants**

Title	Source	Amount	Period	Role
The Effective Stress Law for Permeability During Pore Pressure and Confining Pressure Cycling of Shales (Supplemental Proposal - TASK 11)	Shell	\$314,031	7/1/18-12/31/19	PI
SUTUR: Multi-faceted study of water cut in the Permian Wolfcamp in the Delaware Basin, West Texas	Shell	\$98,500	1/1/16 – 12/31/18	Research Associate
SUTUR Task 11: The Effective Stress Law for Permeability During Pore Pressure and Pressure Cycling of Shale	Shell	\$1,572,345	1/1/14-12/31/18	Research Associate
SUTUR Task 1: Mechanisms of Gas Flow in Shale	Shell	\$457,127	4/1/12-12/31/15	Postdoc
Micro-Mechanical Behaviour of Locked Sands	EPSRC	£274,051	1/1/5-12/31/8	Ph.D. Student

**Invited Presentations**

- Bhandari, A. R., Ramirez, S. R., Flemings, P. B., and Polito, P. J., 2017, “Highlights of Gas and Liquid Permeability Measurements in Wolfcamp Samples”, Shell, Houston, November 2017
- Bhandari, A. R., Flemings, P. B., and Polito, P. J., 2015, “Highlights of gas permeability experiments in shales” Shell, Houston, September 2015
- Bhandari, A. R., 2013, “Measuring nano-darcy permeability in shales”, BEG Seminar Fall 2013

**Contract Reports**

- Bhandari, A. R., Flemings, P. B., Ramiro-Ramirez, S., and Polito, P. J., 2017, Gas and Liquid Permeability Measurements in Wolfcamp Samples: The University of Texas at Austin, report prepared for Shell Oil. 29 p.
- Bhandari, A. R., Polito, P. J., and Flemings, P. B., 2016, Comprehensive Report on the Measurements of Porosity and Permeability in Eagle Ford, Marcellus and Barnett Shale Samples : The University of Texas at Austin, report prepared for Shell Oil. 179 p.
- Bhandari, A. R., Jiang, C., Polito, P. J., Flemings, P. B., Bryant, S. L., and Daigle, H., 2015, Mass Transport in Gas Shales: The University of Texas at Austin, report prepared for Shell Oil. 74p.

- Bhandari, A. R., Polito, P. J., Flemings, P. B., and Bryant, S. L., 2013, Transient Pulse Decay and Steady-State Permeability Measurements on Shell Samples: The University of Texas at Austin, report prepared for Shell Oil. 64p.
- Bhandari, A. R., Smethurst, J. A., and Powrie, W., 2011, Ground Improvement: FLAC3D analyses: University of Southampton, Faculty of Engineering and the Environment, report prepared for Bryne Looby Partners Ltd. 24p.

## **Published Abstracts**

- Bhandari, A. R., Flemings, P. B., Ramiro-Ramirez, S., and Polito, P. J., 2017, Gas and Liquid Permeability Measurements in Wolfcamp Samples (abs.), in Fall Meeting, AGU, New Orleans, Louisiana, December 11–15, Abstract MR51A-0337.
- Bhandari, A. R., Flemings, P. B., Polito, P. J., and Ko, L., 2017, Measurements of intact and fractured Eagle Ford shale gas permeability under in-situ stress (abs.), in BEG MRSL 2017 meeting, March 20–23.
- Bhandari, A. R., Polito, P. J., Flemings, P. B., and Ko, L., 2016, In-situ stress measurement of Eagle Ford shale matrix permeability (abs.), in BEG MRSL 2016 meeting, March 21–24.
- Bhandari, A. R., Polito, P. J., and Flemings, P. B., 2015, Measurements of matrix permeability (under in-situ stress condition) and porosity in Eagle Ford cores (abs.), in BEG MRSL 2015 meeting, April 13–17.
- Bhandari, A. R., Polito, P. J., Flemings, P. B., and Bryant, S. L., 2014, Creep and hysteresis effects on the Marcellus shale matrix permeability behavior (abs.), in Fall Meeting, AGU, San Francisco, California, December 15–19, Abstract H11H-1002.
- Bhandari, A. R., Cronin, M. B., Polito, P. J., Flemings, P. B., and Bryant, S. L., 2013, Mass Transport Properties in the Matrix of the Barnett Shale (abs.), in Fall Meeting, AGU, San Francisco, California, December 9–13, Abstract MR11A-2201.
- Bhandari, A. R., Reece, J. S., Cronin, M. B., Flemings, P. B., and Polito, P. J., 2012, Transient pressure-pulse decay permeability measurements in the Barnett shale (abs.), in Fall Meeting, AGU, San Francisco, California, December 3–7, Abstract MR33B-2462.
- Powrie, W., Bhandari, A. R., and Harkness, R. M., 2008, Localisation of deformation in a naturally locked sand (abs.), in 19th ALERT Workshop, Aussois, France, October 6–8.

## **Educational Activities**

Graduate Research Student Mentor

Sebastian R. Ramirez (Ph.D., UT Austin, Fall 2016 – )

Michael Cronin (M.S., UT Austin, Spring 2012 – Fall 2014)

Guest Lecturer

“Shale resources”, Energy exploration course GEO 330K, UT Austin, April 2015, 2016