

ADITI PANDEY, Ph. D.

Lunar and Planetary Institute, Universities Space Research Association, Houston, TX,
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I. EDUCATION

- A.** Ph.D., Soil Chemistry, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX, May 2022. Major advisor: Dr. Paul Schwab.
- B.** M.S., Soil Science, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX, May 2018, Major advisors: Drs. Fugen Dou and Cristine Morgan.
- C.** B.S., Chemistry with minor in Environmental Science, Mahidol University International College, Mahidol University, Salaya, Thailand, July 2014, Major advisor: Dr. Pakorn Bovonsombat.

II. PROFESSIONAL EXPERIENCE

- A. USRA LPI and NASA JSC ARES**
 - i. Postdoctoral Research Fellow (Mar 2023 - current)
- B. NASA, Johnson Space Center, Houston, TX**
 - i. Student worker (Jan 2020 – Dec 2021)
- C. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal**
 - i. Intern Project Manager (Jan 2016 – Aug 2016)
- D. Mahidol University International College, Salaya, Thailand**
 - i. Lab Technician, Soil Chemistry (Aug 2014 – Dec 2015)
 - ii. Teachers Assistant, ICHM 103 Introduction to Logic (May 2013 – July 2014)

III. TEACHING EXPERIENCE

- A. Texas A&M University, College Station, TX**
 - i. Instructor of Record (Jan 2022 – May 2022)
- B. Guest Lecturer**
 - i. NASA STEM Enhancement in Earth Science (SEES) Summer High School Program (2020 and 2021)
 - ii. UC DAVIS SAS 5 Extraterrestrial Soils (2021 and 2023)
 - iii. Texas A&M University, SCSC 310 Soil Morphology and Interpretations (2021)
- C. Texas A&M University, College Station, TX**
 - i. Graduate Research Assistant, Soil Chemistry (Sep 2018 – Current)
 - ii. Teaching Assistant, SCSC 301-Soil Science (Jan 2019 – May 2019)
evaluation (4.98/5.00 and 4.68/5.00, respectively)
 - iii. Teaching Assistant, SCSC 432-Soil Fertility and Plant Nutrient Management Laboratory (Sep 2017 – May 2017)
 - iv. Teaching Assistant, SCSC 301-Soil Science (Jan 2017 – May 2017)
 - v. Graduate Research Assistant, Soil Science (Sep 2016 – Dec 2016)

IV. PROFESSIONAL HONORS, AWARDS, AND LEADERSHIPS

- A. Organizer and Session Chair (2020-23): Astropedology general and special sessions. Soil Science Society of America Annual Meeting 2021 Co-chairs: A. Broz, B. Sutter, R. Lybrand.
- B. Outstanding achievement for graduate student in soil science, The honor society of agriculture Gamma Sigma Delta, April 2022.
- C. First Place, Dixon Soil Student Competition, Soil Science Society of America Annual Meeting 2021, November 9, Soil Mineralogy Division.
- D. Honorable Mention (HM) for the 2021-2022 Graduate Women in Science (GWIS) National Fellowship Program.
- E. Student Travel Award 2020 Clay Minerals Society, Richmond, WA.
- F. First Place, 2020 Fall Poster Session at the Center for Infrastructure Renewal Advisory Panel, October 21, 2020.
- G. 2019 SCSC Special Achievement Award, Graduate Student Research in Soil Science, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX
- H. Second Place, Graduate Student Soil Chemistry Poster Competition, Science Society of America Annual Meeting 2019, San Antonio, TX
- I. Marsha and Murray Milford Graduate Endowment in 2018
- J. First Place, Graduate Student Oral Presentation Competition, The 55th Annual Soil Survey & Land Resource Workshop 2018. Texas A&M University, College Station, TX

V. GRANTSMANSHIP

- A. Rampe, L.B., **Pandey, A.**, Morris, R. V., Peretyazhko, T., Niles, P B., and Archer, D. P. (2022). Investigating Formation Processes of Sulfate Salts: Implications for Ancient Aqueous Environments on Mars. Selected for the Solar System Workings 2022.
- B. Saavedera, J.A.G., and **Pandey A.** (2019). Developing Sustainable, Resistant Materials: Mimicking Natural Frameworks for Environmental Specificity. A proposal submitted to the Engineer Research and Development Center, Department of Defense. \$109,983/year (5year duration).
- C. Hettiarachchi, G., **Pandey, A.**, Ming, D.W., Schwab, P. (2020). Analysis of amorphous phase abundance and composition in new Martian soil analogues. A proposal submitted to Canadian Light Source Sychrotron facility, University of Saskatchewan. Merit score: 1.67 (Granted 3 sessions with 24 to 72 hours of beamtime).

VI. PUBLICATIONS

A. Peer-Reviewed Publications

- i. **Pandey, A.**, Rampe, E. B., Ming, D. W., Deng, Y., Bedford, C. C., & Schwab, P. 2023. Quantification of amorphous Si, Al, and Fe in palagonitic Mars analogs by chemical extraction and X-ray spectroscopy. *Icarus*, 392, 115362.
- ii. **Pandey, A.**, Nguyen-Vu, M. and Schwab, P., 2022. Novel extraction protocol for evaluating abundances and structural features of amorphous SiO₂. *Icarus*, p.115096.

- iii. **Pandey, A.**, Rampe, E. B., Ming, D. W., Deng, Y. J., Bedford, C., and Schwab, A. P., Quantification of Amorphous Si, Al, and Fe in Palagonitic Mars Analogs by Chemical Extraction and X-ray Spectroscopy. *Icarus. In Review.*
- iv. **Pandey, A.**, Schwab, A.P., and Little, D., Optimization of Magnesium Phosphate Cement: Stabilization of a Kaolinitic Soil. *Transportation Geotechnics. In Review.*
- v. **Pandey, A.**, Dou, F., Morgan, C. L., Guo, J., Deng, J., & Schwab, P. (2020). Modeling Organically Fertilized Flooded Rice Systems and Its Long-Term Effects on 7Grain Yield and Methane Emissions. *Science of The Total Environment*, 142578.
- vi. Bajpayee, A., Farahbakhsh, M., Zakira, U., **Pandey, A.**, Ennab, L. A., Rybkowski, Z., ... & Banerjee, S. (2020). In situ Resource Utilization and Reconfiguration of Soils into Construction Materials for the Additive Manufacturing of Buildings. *Frontiers in Materials*, 7, 52.
- vii. Bovonsombat, P., Teecomegaet, P., Kulvaranon, P., **Pandey, A.**, Chobtumskul, K., Tungsirirurp, S., ... & Siricharoensang, P. (2017). Regioselective monobromination of aromatics via a halogen bond acceptor-donor interaction of catalytic thioamide and N-bromosuccinimide. *Tetrahedron*, 73(46), 6564-6572.
- viii. Bovonsombat, P., Sophanpanichkul, P., **Pandey, A.**, Tungsirirurp, S., Limthavornlit, P., Chobtumskul, K., ... & Teecomegaet, P. (2015). Novel regioselective aromatic chlorination via catalytic thiourea activation of N-chlorosuccinimide. *Tetrahedron Letters*, 56(17), 2193-2196.
- ix. **Pandey, A.**, Rampe, E. B., Ming, D. W., Bullard, J. W., Bedford, C., and Schwab, A. P., Chemical Extraction and X-Ray Spectroscopic Quantification of Amorphous Si, Al, and Fe in Phyllosilicate-poor Palagonitic Samples. *In pipelines.*
- x. **Pandey, A.**, Rampe, E. B., Ming, D. W., Hettiarachchi, G., Pitumpe, P., and Schwab, A. P., Synchrotron Spectromicroscopic Analyses of Amorphous Phases in Palagonitic Soil and Rock Samples. *In pipelines.*
- xi. **Pandey, A.**, Ming, D. W., Grajales, F., Boyd, A., and Schwab, A. P., In Situ Resource Utilization: Synthesis of Structural Materials from Extraterrestrial Regolith. *In pipelines.*

B. Other Publications

- i. **Pandey, A.** (2022). Nanoscale analysis of x-ray amorphous phases in palagonitic Martian analogs, and in situ resource utilization of soil for extraterrestrial construction, Ph.D. Dissertation. Texas A&M University, College Station, TX.
- ii. **Pandey, A.** (2018). Quantification of soil ecosystem services from organic fertilized rice production in Beaumont, Texas. M.S. Thesis. Texas A&M University, College Station, TX.
- iii. **Pandey, A.**, Bhattarai, N., Adhikary, B., Karky, B. S., Pokhrel, C. P., & Pathak, A. (2016). Baseline study of endocrine-disrupting compounds and pharmaceuticals and personal care products in waterways surrounding Chitwan National Park, Nepal. The International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.
- iv. **Pandey, A.** (2014). Catalyst screening for regioselective aromatic halogenation via catalytic nucleophilic activation of N-chlorosuccinimide and N-bromosuccinimide. Undergraduate Thesis (Chemistry). Mahidol University, Salaya, Thailand.

C. Scientific Abstracts

- i. **Pandey, A.**, Schwab, A. P., Deng, Y., Ming, D. W., and Rampe, E. B., (2021). Chemical Extraction Methods and X-ray Spectroscopic Techniques for Quantification of Amorphous Si, Al, and Fe in Phyllosilicate-poor Palagonitic Samples. Soil Science Society of America Annual Meeting 2021, November 9, Soil Mineralogy Division (Oral presentation).
- ii. **Pandey, A.**, A.P. Schwab, D. Little., and Ming, D. W. (2020). In Situ Resource Utilization: Synthesis of Magnesium Cement Stabilized Regolith for Terrestrial and Extraterrestrial Construction. Soil Science Society of America Annual Meeting 2021, November 9, Soil Mineralogy Division (Poster presentation).
- iii. **Pandey, A.**, A.P. Schwab, and D. Little., (2020). Magnesium phosphate cement for rapid soil stabilization. First International Virtual Colloquium on Engineering, Sciences, and Technology and the Link with the Sustainable Development Goals. November 25, 2020. Virtual
- iv. **Pandey, A.**, Schwab, A. P., Deng, Y., Ming, D. W., and Rampe, E. B., (2020). Comparison of Chemical Extraction Methods with X-Ray Spectroscopic Techniques to Tabulate Concentrations of Si and Al in the Amorphous Phase of Phyllosilicate-Poor Palagonitic Samples. Soil Science Society of America Annual Meeting 2020, November 9, Soil Mineralogy Division (Poster presentation). Virtual
- v. **Pandey, A.**, Schwab, A. P., Little, D., Bullard, J., and Ming, D. W., (2020). Biomimicry of Naturally Occurring Minerals to Develop Composites with the Chemical, Mineralogical, and Engineering Properties Ideal for Construction with Soil. Soil Science Society of America Annual Meeting 2020, November 9, Soil Mineralogy Division (Poster presentation). Virtual
- vi. **Pandey, A.**, Schwab, A. P., and Ming, D. W., (2020). Analysis of X-ray Amorphous Phase Abundance and Composition in Basaltic Samples as Potential Amendments for Martian Soil Analogues. Clay Mineral Society Annual Meeting 2020, October 18-23, Extraterrestrial Clays: Insight from Earth-Based Studies (Oral presentation). Virtual
- vii. **Pandey, A.**, Schwab, A. P., Ming, D. W., Sutter, B., Gruener, J., (2019). Chemical, mineralogical, and engineering properties of composites of Martian and Lunar simulants as extraterrestrial construction materials. Soil Science Society of America Annual Meeting 2019, Soil Mineralogy Division (Oral presentation). TX
- viii. **Pandey, A.**, Schwab, A. P., Ming, D. W., Sutter, B., Gruener, J., (2019). Characterizing binder-stabilized composites synthesized from a Martian Soil simulant for extraterrestrial construction. Soil Science Society of America Annual Meeting 2019, Soil Chemistry Division (Poster presentation). San Antonio, TX
- ix. Schwab, A. P., **Pandey, A.**, Birgisson, B., Banerjee, S., Ming, D. W., Sutter, B., (2019). Rapid 3D Printing for construction of extraterrestrial buildings with indigenous materials. Soil Science Society of America Annual Meeting 2019, Soil Mineralogy Division (Oral presentation). San Diego, CA
- x. **Pandey, A.**, Schwab, A. P., Birgisson, B., Banerjee, S., Ming, D. W., Sutter, B., (2019). Extraterrestrial construction with 3D Printing: Material selection and testing. Soil Science Society of America Annual Meeting 2019, Soil Mineralogy Division (Poster presentation). San Diego, CA

- xi. Pandey, A.** (2018). Valuation of ecosystem services generated from adopting organic management alternatives: An approach to sustainable rice production in Beaumont, TX. The 55th Annual Soil Survey & Land Resource Workshop (Oral presentation). College Station, TX.
- xii. Pandey, A.,** Dou F., Morgan, C. L. S., Deng, J., Wang, Y., (2017). Investigation of benefits from organic management alternatives using DNDC model simulations for developing sustainable practices in Texas rice production. Soil Science Society of America Annual Meeting 2017, Agronomic Production Systems Division (Poster presentation). Tampa, FL