

NAGASREE GARAPATI

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Education

- **Doctor of Philosophy** in Chemical Engineering
Minor in Applied Fluid Dynamics
West Virginia University, Morgantown, WV (GPA: 4.0/4.0) 2010-2013
- **Master of Science** in Chemical Engineering
West Virginia University, Morgantown, WV (GPA: 4.0/4.0) 2007-2009
- **Bachelor of Technology** in Chemical Engineering
Osmania University, Hyderabad, AP, India (First in Class of 60) 2003-2007

Certification

Engineer Intern, West Virginia State Board of Registration for Professional Engineers 2010
Reservoir GeoMechanics, Stanford Online 2014

Research Experience

Research Associate– University of Minnesota, Minneapolis, MN 2015-Present
Advisor: **Dr. Martin O. Saar, Department of Earth Sciences.**
Topic: *Numerical modeling of geothermal and geologic CO₂ sequestration systems.*

Academic Guest - Swiss Federal Institute of Technology in Zurich (ETH-Z) 2015-Present
Advisor: **Dr. Martin O. Saar, Department of Earth Sciences.**
Topic: *Numerical modeling of CO₂ based geothermal energy alternatives.*

Postdoctoral Associate – University of Minnesota, Minneapolis, MN 2013-2015
Advisor: **Dr. Martin O. Saar, Department of Earth Sciences.**
Topic: *A novel method using CO₂ and Geothermal resources for sustainable energy production and storage.*

Graduate Research Assistant – West Virginia University, Morgantown, WV 2007-2013
Reservoir Modeler in Ignik Sikumi Gas Hydrate Field Trial Test Project Team.
Advisor: **Dr. Brian J Anderson, Department of Chemical Engineering.**
Topic: *Reservoir simulation for production of CH₄ gas from gas hydrate reservoirs by injection of pure CO₂ or CO₂ + N₂ gas mixture.*

Teaching Experience

Mentor

Swiss Federal Institute of Technology in Zurich (ETH-Z)
Guiding a Master student thesis project Present
University of Minnesota, Minneapolis, MN Summer 2013
Guided an undergraduate student intern in her project.
West Virginia University, Morgantown, WV 2012-2013
Guided new graduate students in lab with their projects.

Guest Lecture

West Virginia University, Morgantown, WV 2009-2013
ChE 320 – Chemical Engineering Thermodynamics.

Skills

Reservoir simulation software: CMG's IMEX, TOUGH2, iTOUGH2, TOUGHREACT, TOUGH+/Hydrate, HydrateResSim, Petrasim, NUFT.

Process simulation software: ChemCAD, DYNsSim, Engineering Equation Solver (EES).

Operating Systems and Packages: MAT Lab, TecPlot, MS Office, MS-Dos, Sigma Plot, SPSS.

Programming Language: Shell scripting, C, C++, FORTRAN, and Python.

Communication & Organizational

- Excellent planning and organizational skills developed through professional activities.
- Leadership and team work qualities enhanced by group projects.
- Grant writing skill developed by writing a proposal for Original Research Proposition.

Professional Society Memberships

Reviewer Desalination	2016-Present
Reviewer Journal of Natural Gas Science and Engineering	2015-Present
American Institute of Chemical Engineers (AIChE)	2009-Present
American Chemical Society (ACS)	2012-Present
American Geophysical Union (AGU)	2013-Present
University of Minnesota Postdoctoral Association (UMN-PDA, Treasurer)	2013-2015

Awards & Achievements

- **Graduate Research Assistantship**, West Virginia University, Morgantown, WV **2007-2013**
- **Padmashri B.V.Raju Best Merit Student Award** in Chemical Engineering by Indian Institute of Chemical Engineers (IChE), Hyderabad. **2006**
- **Gold Medal** for best student in academics, Little Flower Junior College, India. **2003**

Community Service Projects

- Volunteer at SV Center – Edina, MN **2013-2015**
- Volunteer member for AID – Morgantown **2007-2013**
- Volunteered for Ronald McDonald House Charities **July 2010**

Publications

Peer Reviewed Papers

- **Garapati, N.**, Randolph, J., Saar, M.O., “*Brine displacement by CO₂, heat energy extraction rates, and lifespan of a CO₂-limited, axi-symmetric CO₂ Plume Geothermal system with a horizontal production well*”, *Geothermics*, 55: 182-194.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*CO₂-Plume Based Geothermal (CPG) Heat Extraction in Multi-layered Geologic Reservoirs*” *Energy Procedia*, 63 (2014): 7631–7643.
- Luhmann, A.J., Kong, X-Z., Tutolo, B.M., **Garapati, N.**, Bagley, B.C., Saar, M.O., Seyfried, W.E.Jr., “*Experimental dissolution of dolostone by CO₂- charged brine at 100 °C and 150 bars: Evolution of porosity, permeability, and reactive surface area.*”, *Chemical Geology*, 380 (2014): 145-160.
- **Garapati, N.**, Anderson, B.J., “*Statistical Thermodynamics Model and Empirical Correlations for Predicting Mixed Hydrate Phase Equilibria*”, *Fluid Phase Equilibria* 373 (2014): 20-28.
- **Garapati, N.**, Adams, B. M., Randolph, J., Kuehn, T.H., Saar, M.O., “*Auxiliary Heating of Geothermally Preheated Brine or CO₂ to Boost Electricity Production*”, *Geothermics*, in Preparation.
- Adams, B.M., Kuehn, T.H., Bielicki, J.M., **Garapati, N.**, Saar, M.O., “*A characterization of temperature depletion in sedimentary basins and its effect on the electric power output of CO₂ Plume Geothermal (CPG) power systems*”, *Geothermics*, in Preparation.
- **Garapati, N.**, McGuire, P.C., Anderson, B.J., “*Reservoir Modeling of Production of CH₄ from Natural Gas Hydrates by Injection of a CO₂+N₂ Gas Mixture using Mix3HydrateResSim*”, in Preparation.
- **Garapati, N.**, Liu, Y., Anderson, B.J., “*Implementation of Cell Potential Method into Reservoir Simulation Tool Hydrateressim: Binary Hydrates Simulations CH₄-CO₂ and CH₄-N₂*”, in Preparation.

Conference Proceedings

- **Garapati, N.**, Randolph, J., Finsterle, S., Saar, M.O., “*Simulating Reinjection of Produced Fluids into the Reservoir*” in Proceedings of the 41st Workshop on Geothermal Reservoir Engineering, Stanford Geothermal workshop, Stanford, CA, February 2016.
- Saar, M.O., Buscheck, A. T., Jenny, P., **Garapati, N.**, Randolph, J., Bielicki, M.J., “*Numerical Study of Combined Multi-Fluid and Multi-level Geothermal System Performance*” in Proceedings of World Geothermal Congress, April 2015.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*Design of CO₂ -Plume Geothermal (CPG) subsurface system for various geologic parameters*” in Proceedings of the Fifth International Conference on Coupled Thermo-Hydro-Mechanical-Chemical (THMC) Processes in Geosystems: Petroleum and Geothermal Reservoir Geomechanics and Energy Resource Extraction, Salt Lake City, UT, February 2015.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*Superheating Low-Temperature Geothermal Resources to Boost Electricity Production*” in Proceedings of the Fortieth Workshop on Geothermal Reservoir Engineering, Stanford Geothermal workshop, Stanford, CA, January 2015.
- Anderson, B.J., **Garapati, N.**, Sridhara, P., McGuire, P.C., “*Modeling the injection of carbon dioxide and nitrogen into a methane hydrate reservoir and the subsequent production of methane gas on the north slope of Alaska.*” in Proceedings of the Eighth International Conference on Gas Hydrates, Beijing, China, July 2014.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*Total Heat Energy Output from, Thermal Energy Contributions to, and Reservoir Development of Conventional, Hydrofractured, and CO₂ Plume Geothermal (CPG) Systems*” in Proceedings of the 39th Workshop on Geothermal Reservoir Engineering, Stanford Geothermal workshop, Stanford, CA, February 2014.
- **Garapati, N.**, McGuire, P.C., Anderson, B.J., “*Modeling the Injection of Carbon Dioxide and Nitrogen into a Methane Hydrate Reservoir and the Subsequent Production of Methane Gas on the North Slope of Alaska.*” Unconventional Resources Technology Conference. Denver, CO, August 2013.
- Anderson, B., **Garapati, N.**, McGuire, P. “*Reservoir Modelling and Numerical Analysis of the Ignik Sikumi Gas Hydrate Field Trial*” in 75th EAGE Conference & Exhibition-Workshops, London, UK, June 2013.
- **Garapati, N.**, Anderson, B.J., “*Implementation of cell potential code into HydrateResSim simulator*”, CO₂ Capture, Sequestration, Conversion and Utilization, FUEL: Division of Fuel Chemistry, 243rd ACS National Meeting, San Diego, CA, March 2012.
- **Garapati, N.**, Velaga, S., Anderson, B.J., “*Development of a Thermodynamic Framework for the simulation of Mixed Gas Hydrates: Formation, Dissociation and CO₂-CH₄ Exchange*”, in Proceedings of the Seventh International Conference on Gas Hydrates, Edinburgh, Scotland, U K, July 2011.

Paper Presentations

- **Garapati, N.**, Adams, B. M., Randolph, J., Kuehn, T. H., Saar, M.O., “*A hybrid geothermal energy conversion technology: Auxiliary heating of geothermally preheated water or CO₂ – a potential solution for low-temperature resources*” in EGU General Assembly, Vienna, Austria, 2016.
- **Garapati, N.**, Adams, B. M., Randolph, J., Kuehn, T. H., Saar, M.O., “*Auxiliary heating of geothermally preheated water or CO₂ – a potential solution for low- to moderate-temperature geothermal resources*” in AGU Fall Meeting, San Francisco, CA, 2015.
- **Garapati, N.**, Adams, B. M., Saar, M.O., Randolph, J., Kuehn, T. H., “*Optimizing Geothermal System Performance Through Iterative Coupling of Reservoir and Surface Plant Simulations*”, in First Workshop of Numerical Geothermal Simulation, Munich, Germany, 2015.

- **Garapati, N.**, Randolph, J., Saar, M.O., “*Effect of Reservoir-Caprock Interface Dip and Circulation of Produced Fluid on CO₂-Based Geothermal Heat Extraction from Saline Aquifers*” in AGU Fall Meeting, San Francisco, CA, 2014.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*CO₂-Plume Geothermal (CPG) system performance for various operating and geologic parameters*” in AIChE Annual meeting, Atlanta, GA, 2014.
- **Garapati, N.**, Randolph, J., Saar, M.O., “*Analysis of Geologic Parameters on the Performance of CO₂-Plume Geothermal (CPG) Systems in a Multi-Layered Reservoirs*” in AGU Fall Meeting, San Francisco, CA, 2013. (Poster)
- **Garapati, N.**, McGuire, P.C., Anderson, B.J., “*Reservoir Modeling of Production of CH₄ from Natural Gas Hydrates by Injection of a CO₂+N₂ Gas Mixture*” in AAPG Annual Convention & Exhibition, Pittsburgh, PA, USA, 2013. (Poster)
- **Garapati, N.**, McGuire, P.C., Liu, Y., Anderson, B.J., “*Modeling the Injection of Carbon Dioxide and Nitrogen into a Methane Hydrate Reservoir and the Subsequent Production of Methane Gas on the North Slope of Alaska*” in AGU Fall Meeting, San Francisco, CA, 2012.
- **Garapati, N.**, Anderson, B.J., “*Injection of Carbon Dioxide and Nitrogen into Methane Hydrate Reservoirs: Binary HydrateResSim Simulations*” in AIChE Annual meeting, Pittsburgh, PA, USA, 2012.
- **Garapati, N.**, Velaga, S., Anderson, B.J., “*Gas Hydrates Modeling: Spanning Multiple Scales*” in AIChE Annual meeting, Pittsburgh, PA, USA, 2012. (Poster)
- **Garapati, N.**, Anderson, B.J., “*Phase Equilibrium Predictions of Mixed Hydrates by Cell Potential Code: Validation using Experimental Data and Implementing into Reservoir Simulators*” in AIChE Annual meeting, Salt lake city, UT, USA, 2010.
- **Garapati, N.**, Anderson, B.J., “*Predictions of Phase Equilibrium Data of Mixed Hydrates Using the Cell Potential Method,*” in West Virginia Academy of Science 85th Annual Meeting, Morgantown, WV, USA, 2010. (Poster)
- **Garapati, N.**, Anderson, B.J., “*Predictions of Mixed Hydrate Phase Equilibria and the Swapping of CH₄ Hydrate with CO₂ and CO₂+N₂ Mixtures*” in AIChE Annual meeting, Nashville, TN, USA, 2009.
- **Garapati, N.**, Kapu, A., Vudata, V. B.; “*Exergy Evaluation of Analysis in Methanol-Water Distillation Column*” in CHEMCON, Bharuch, Gujarat, India, 2006.
- **Garapati, N.**, Kapu, A.; “*Biodiesel Is a Potential Future Fuel in India*” in SCHEMCON, J.N.T.U, Ananthapur, India, 2006.
- **Garapati, N.**, Dasari, A., Kapu, A.; “*Separation of Solid Particles by Density Difference in Liquid-Solid Fluidized Bed*” in FUSION, J.N.T.U, Ananthapur, India, 2005.