NATIONAL GEOTHERMAL ACADEMY 2012

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The National Geothermal Academy (NGA) is an intensive 8-week overview of the different aspects involved in developing a geothermal project, hosted at University of Nevada, Reno. The class of 2012 was the second graduating class from the academy and included 21 students from nine states, as well as Saudi Arabia, Dominica, India, Trinidad, Mexico. The class consisted of people from a wide range of scholastic abilities from students pursuing a Bachelor's or Master's degrees, to entrepreneurs and professionals looking to improve their knowledge in the geothermal field. Students earned 6 credits, either undergraduate or graduate, in engineering or geology. Overall, the students of the NGA, although having diverse backgrounds in engineering, geology, finance, and other sciences, came together with a common passion to learn more about geothermal.

Each week of the program focused on a specific topic in geothermal: an introduction to geothermal energy, geology and geochemistry, field trips on direct use and geology, geophysics, drilling engineering, reservoir engineering, power plant design, and policy and permitting. All subjects were taught by leading professionals in the respective areas from all over the country. The instructors and guides who lead the students through this intensive course were:

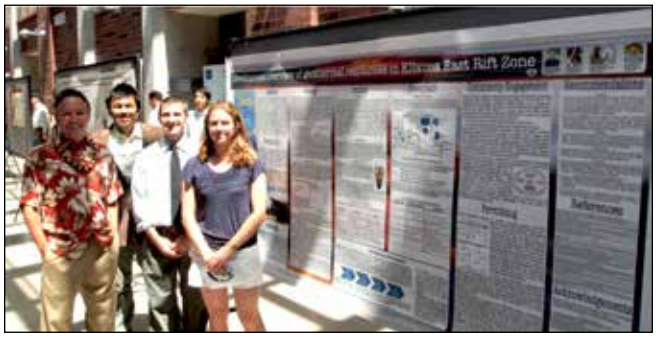
- Jefferson Tester, Energy Institute at Cornell University
- Michal Moore, Institute for Sustainable Energy, Environment and Economy at the University of Calgary
  Joseph Moore, University of Utah
- John Lund, Emeritus, Geo-Heat Center
- Toni Boyd, Geo-Heat Center
- Gene Suemnicht, EGS, Inc.
- David Blackwell, Southern Methodist University
- Bill Livesay, Livesay Consultants
- Lou Capuano III, Capuano Engineering Consultants
- Roland Horne, Stanford University
- Ronald DiPippo, Renewable Energy Consultant
- Brian Anderson, West Virginia University
- John McKinsey, Stoel Rives LLP
- Mark Demuth, University of Nevada Reno and WCRM, Inc.

The course was a daily 8-5 lecture with some field trips and homework assignments with a weekly exam culminating the knowledge gained from the various instructors. In addition to the regular class schedule, the students participated in research projects that were presented as posters; graduate students also wrote accompanying papers. The students had seven weeks to assemble a project team and topic, research their area of interest, compile the information in a poster format, and finally compose a professional paper to present at the closing ceremony and graduation of the NGA. The project authors and titles included:

- Gabriel Allen, The view of geothermal by Society
- Rachel Silverman, Envisioning a model for innovative EGS development in the San Francisco Bay area
- Basheer Hashem and Thamr Al Hamoudi, Geothermal development for the Kingdom of Saudi Arabia
- Steven Erdahl, Geothermal hydrocarbon co-production (GHCP)
- Robert Kinslow, Piyush Bakane, Bridget Hass and Phillip Maddi, Development overview of geothermal resources in Kilauea East Rift Zone
- Brandon Iglesias, ReactWell's™ underground

geothermal biomass-to-oil and bioproduct platform vs. geothermal power production

- Dustin Thelen, Application of ReactWell's™ patent-pending underground geothermal bioreactor technology to desert and tropical climates including specific site studies
- Mitch Allen and Corina Forson, a summary of structural settings related to known geothermal systems in the Basin and Range province: Emphasis on the geothermal potential of the southern Black Rock Desert, Nevada
- Manuel Arrubarrena and Leslie Pelayo, Potential development for geothermal direct uses in Mexico with a specific site recommendation
- Jason Timothy, Dalton Eloi, Nichole Seaman Tyson and Mandela Christian, Future Geothermal development potential in Dominica
- Cary Lindsey, Utilizing direct use geothermal for industrial thermal needs in Mississippi
- Randy Koon Koon, Geothermal energy prospecting for the Caribbean islands of Nevis and Montserrat



The NGA wasn't just hard work though, Wendy Calvin, NGA Director and NGA Assistant Director Betsy Littlefield made sure there was ample opportunity on the weekends to relax and have fun. From barbeques, hikes, volleyball games, tubing, swimming at Lake Tahoe, and visiting places such as Canby, Mammoth Lakes, the Geysers, and Klamath Falls, the NGA staff kept the spirits high. Through rigorous work and good relaxation, the NGA students became a close-knit community.

For those who are interested in pursuing a career in geothermal energy development, or those in the industry seeking to sharpen their knowledge on a specific subject within the field, the NGA is the nation's best program for a comprehensive, industry-focused view of the curriculum.

This issue of the Geo-Heat Center bulletin includes several of the students' research papers on a variety of geothermal subjects.