POWER PLAYS

GEOTHERMAL ENERGY IN OIL AND GAS FIELDS

Southern Methodist University

April 25-26, 2016
SMU Geothermal Conference

Roy M. Huffington
Department of Earth Sciences
Dallas, Texas

SMU | GEOTHERMAL LABORATORY

Director: David Blackwell
Faculty: Matthew Hornbach
Coordinator: Maria Richards
Project Specialist: Cathy Chickering Pace
Outreach Coordinator: Christine Ferguson

http://www.smu.edu/geothermal

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SMU GEOTHERMAL LABORATORY

The SMU Geothermal Lab was established in 1970 by Dr. David Blackwell. We are a self-funded research facility, with a variety of ongoing geothermal resource projects. Our faculty, staff, and students strive to broaden the understanding and use of geothermal energy, from the simplest form, geothermal heat pumps for buildings, to the large-scale deployment of geothermal power plants providing energy for our cities. Our research also explores opportunities to integrate renewable geothermal projects in an oil and gas setting.

Our expertise includes:

- Academic research by faculty, staff, and students
- Data integration into maps such as the Geothermal Map of North America
- National Geothermal Data System Node at http://geothermal.smu.edu/gtda/
- Research projects such as Enhanced Geothermal Potential of the Cascades, Geothermal Synthesis of Dixie Valley, Nevada, well temperature logs for climate change indicators, and the stability of methane hydrates along continental shelves
- Well logging with high precision temperature measurements
- Rock sample analysis of thermal conductivity for research and commercial clients

In addition to our research, the Lab assists the public through:

- Teacher and student educational classroom materials for STEM programs
- A monthly newsletter for the geothermal, oil/gas, and energy industries, along with information for the public on events, funding, and research opportunities
- Presentations, news articles, and social media updates
- Hosting the Power Plays conference and industry meetings
- Suggested publications and papers for those interested in learning more

Contact us:

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Conference Agenda
Monday, April 25

5:30 PM **Welcome Reception and Poster Session**

Javed Ahmad
Energy Foundation-Pakistan
Power Generation Using Geothermal Energy from Oil and Gas Fields in Pakistan

Miguel Ángel Benítez Torreblanca and Héctor Miguel Aviña Jiménez
Grupo iiDEA, UNAM
iiDEA Group research update

John Barta
University of Nevada, Reno
Sustainability for Renewable and Nonrenewable Resources

Casey Brokaw
SMU Huffington Department of Earth Sciences
Basin Temperatures for Maturation

Marc Buursink
U.S. Geological Survey
The Potential for Merging a Regional Low-Temperature Geothermal Resources Assessment with the Recent USGS Geologic Carbon Dioxide Storage Assessment

Erin Camp
Cornell University
Repurposing a New York Gas Field for Geothermal Direct Use Heating in the Town of Corning

Lea-Der Chen
Texas A&M University - Corpus Christi and InnerGeo
Heat Transfer Model for Estimates of Energy Extraction from a Closed-Loop Geothermal System

Jeff Dye and Dexter Jacobs
LoCap Energy
Stored Heat, Recovered Potential: Energy Storage and Efficiency Solutions

Kyle Gluesenkamp
Oak Ridge National Laboratory
Transporting Heat of Co-produced Water for Conditioning Buildings

Conference Agenda
Monday, April 25

5:30 PM **Welcome Reception and Poster Session (Continued)**

Taylor Grysen, D. Gibson, H. Johnson and K. Nicholson
Ball State University
Heat Flow Map of Sumatra, Indonesia

A. Rashid Hasan, Raka Islam, Gibran Hashmi and Ron Loveday
Texas A&M University and InnerGeo
An Efficient Closed-Loop Geothermal Energy Extraction System

Michael Jones
University of Texas at Austin
Geothermal Energy Potential of Oil & Gas Wells: Geospatial Distribution Analysis Utilizing Data from the National Geothermal Data System

Kevin Kerlin
Helidyne
Power Generation from Flare Gas Using Planetary Rotor Expander Technology

Josh Mengers
Geothermal Technologies Office
U.S. Department of Energy Geothermal Technologies Office Desalination Projects

Randy Normann
Perma Works LLC
Anyone's Programmable Logging Tool

Satish Ravindran and Chris Ruffer
HARC
Flare Gas Reduction at the Well Head

John Sisler, Sadiq J. Zarrouk, Alex Urgel, Yoong Wei Lim, Richard Adams and Steven Martin
2Phase Sensors
Measurement of Pipeline Flows in Geothermal Pipelines Using Load-Cells: Field Trial Results/ Using Radio Frequency (Rf) Power Measurements: Experimental Results

Tom Williams
National Renewable Energy Lab
Free Turbines for Co-production Demonstration

8:00 PM **Close of Day**

Conference Agenda
Tuesday, April 26

7:00 AM **Onsite Registration, Coffee and Networking**

8:00 AM **Maria Richards**
SMU Geothermal Laboratory
Welcome and Opening Remarks

8:10 AM **Matthew Hornbach**
SMU Huffington Department of Earth Sciences
Determining Organic Carbon Using Thermal Conductivity

8:30 AM **Douglas Waples**
Sirius Exploration Geochemistry
Present and Paleosurface Temperatures: The Start of the Subsurface Temperature Story

8:50 AM **Tim Reinhardt**
U.S. DOE Geothermal Technologies Office
Progress and Outlook for the Department of Energy's Geothermal Technology Program

9:10 AM **Richard Wynn**
Deep River Group, LLC
Power of Intersections: Using the Oilfield as a Base for Alternative Energy Production

9:30 AM **Networking**

10:00 AM **A. Rashid Hasan**
Texas A&M University and InnerGeo
An Environmentally Friendly Closed-Loop Geothermal Energy Extraction System

10:25 AM **Will Gosnold**
University of North Dakota
Continental Resources - North Dakota Geothermal Power Demonstration Project

10:50 AM **Discussion / Q & A**

11:00 AM **Networking**

11:30 AM **Panel: Solving Water Issues**
Josh Mengers - *DOE Geothermal Technologies Office*
Craig Turchi - *National Renewable Energy Laboratory*
Aaron Wilson - *Idaho National Laboratory*

12:00 PM **Luncheon**

Conference Agenda
Tuesday, April 26

1:30 PM **Hala Ballouz**
Electric Power Engineers
Integration and Impact of Geothermal on Transmission and Distribution

1:50 PM **Susan Petty**
AltaRock Energy
Transitioning Coal to Geothermal: Baseload Renewable Power with no CO_2

2:10 PM **Steven Hummel**
EXERGY S.p.A.
Radial Outflow Turbine Technology in ORC Applications for Co-Produced Water and Other Oil and Gas Applications

2:30 PM **Discussion / Q & A**

2:40 PM **Networking**

3:10 PM **Simone Passera**
Turboden S.r.l.
Enhanced Efficiency, Sustainable Power Generation, and CO_2 Emission Reduction through Organic Rankine Cycle Technology

3:30 PM **Chad Augustine**
National Renewable Energy Laboratory
Design Requirements for Commercial Sedimentary Geothermal Projects

3:50 PM **Suri Suryanarayana**
Blade Energy Partners
Strain Based and Low Cycle Fatigue Methods to Design Geothermal Well Tubulars

4:10 PM **Networking**

4:30 PM **Peter Malin**
ASIR
5 km to Boiling Water: The St1 Helsinki District-Heating Gamble

4:50 PM **Panel: Direct Use of Geothermal Fluids**
Josh Mengers - *DOE Geothermal Technologies Office*
Erin Camp - *Cornell University*
Kyle Gluesenkamp - *Oak Ridge National Laboratory*

5:20 PM **Final Q & A**

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Biosketch of Presenters
(Alphabetical Order)

Javed Ahmad

Energy Foundation-Pakistan

Javed Ahmad has 50 years of experience in oil & gas, minerals, gemstones, renewable, geothermal energy, solar, and planning & development of minerals based industrial projects. For the last five years he has studied the geothermal resources of Pakistan. He recently completed a report, "Preliminary Assessment of Geothermal Energy Resources of Pakistan," and speaks on the topic internationally. Javed installed the first geothermal heat pump in Pakistan for demonstration & public awareness. He plans to install the first geothermal energy power plant available in the oil & gas fields of Pakistan. He has been planning and supervising field exploration, gravity, magnetic & seismic surveys and drilling activities in fourteen oil & gas Exploration Blocks in Pakistan.

Javed is the Founder and Chairman of Energy Foundation Pakistan, a Non-Profit organization for the development of renewable energy resources to provide clean, sustainable and affordable energy to the people of Pakistan.

A member of Geothermal Resource Council, USA & International Geothermal Associations, Javed holds an M.A. Economics, B.Sc. Honors in Geology and L.L.B. and Post-Graduate Diploma in Environmental Law from Universities in Pakistan. He received training with U.S. Geological Survey, U.S. Bureau of Mines, U.S. Civil Service Commission, and at Michigan State University under USAID Program in 1972.

Chad Augustine

National Renewable Energy Laboratory

Chad Augustine is the team lead of the geothermal analysis group at the National Renewable Energy Laboratory (NREL) and serves as the lead analyst for the DOE Geothermal Technologies Office. His work focuses primarily on the analysis of the costs, performance, enabling technologies, and resource potential of existing and emerging geothermal technologies. He has also been integrally involved in developing and leading the Colorado SURGE, a collaboration between NREL and the Colorado School of Mines focused on applying petroleum technologies to the geothermal industry. Chad has over a decade of experience working within the geothermal community, dating back to his efforts as a co-author of MIT's 2006 "Future of Geothermal Energy" report. Chad has a B.S. in Chemical Engineering from Iowa State University, M.S. in Chemical Engineering Practice from the Massachusetts Institute of Technology and a Ph.D. in Chemical Engineering also from the Massachusetts Institute of Technology.

Hala N. Ballouz

Electric Power Engineers

Hala N. Ballouz is the President and owner of Electric Power Engineers, with multiple offices in the U.S. and internationally. She has over 20 years' experience in integration of energy resources in transmission and distribution networks. Ballouz is an expert in transmission system analysis, substation and distribution system design, resource and grid feasibility studies, energy storage, renewable energy, as well as distribution system planning and operations. In her recent role as President of TREIA, Hala initiated a mission to open the barriers to facilitate market readiness for Distributed Energy Resource integration. Hala served as an expert witness on resource adequacy and transmission grid reliability in California, and provides the same expertise in Texas. An industry leader in renewable energy integration, Hala currently serves as international consultant in this capacity in Jamaica, Hawaii, and is on the board of several organizations. She is a registered Professional Engineer in three States and is also registered with the Board of Engineers in Lebanon. Before practicing professional engineering consulting, she earned her Bachelor and Master of Science degrees in Electrical Engineering from Texas A&M University.

John Barta

University of Nevada, Reno

John Barta is completing his Graduate Renewable Energy Certificate at the University of Nevada, Reno (May Graduation). Before going back to school, he worked in the mining industry as an Environmental Manager of the mines at Jerritt Canyon Mine, Springer Tungsten Mine, Florida Canyon Mine, Standard Mine, and the Getchell Gold Mine. John has a B.S. in Engineering Geology and Engineering Mining from Texas A&M University. He is an active Scout Leader and President of the Board of Directors for the Northern Nevada Arts Council.

Miguel Ángel Benítez Torreblanca

Grupo iiDEA, Instituto de Ingeniería, Universidad Nacional Autónoma de México

Miguel Ángel Benítez Torreblanca, has been part of the iiDEA© Group for three years. iiDEA© is a multidisciplinary applied research group, focusing on the technological development for the use of low and medium enthalpy geothermal energy in Mexico. Holding a Bachelor's Degree in Mechatronics Engineering, he is currently working on his graduate thesis (Mechanical Engineering), developing a fault-tolerant control system for a Flash Evaporation Binary Cycle. The pursuit of fault-tolerant systems is part of an on-going Research & Development stage, in which maximum reliability of the system is needed under laboratory and on-site tests.

Casey Brokaw

SMU Geothermal Lab, Huffington Dept. of Earth Sciences

Casey Brokaw has a Bachelor of Science in Geology from SMU and is currently pursuing a Master's Degree in Geophysics. His Master's research is sponsored by Andarko Petroleum Corporation focusing on the thermal maturation processes of the oil and gas producing Denver Basin. His research includes understanding geothermal processes and how they can be applied to help tackle America's energy demands.

Marc Buursink

U.S. Geological Survey (U.S.G.S.)

Marc Buursink has been a research geologist with the U.S. Geological Survey (USGS) since 2010. As part of the Eastern Energy Resource Science Center he works on geologic carbon dioxide storage research, geophysical data synthesis, and oil and gas assessments. While a research earth scientist at Chevron Energy Technology Company from 2005 to 2010, he worked on seismic modeling, basin analysis problems, and deepwater Gulf of Mexico exploration. Previously at the USGS, he applied geophysical methods to groundwater contamination investigations. Marc earned a B.A. degree in physics and environmental science from the University of Virginia, an M.S. degree in geosciences from the University of Connecticut, and a Ph.D. in geophysics from Boise State University. He is an active member of the Geological Society of America and the Potomac Geophysical Society. In his spare time he serves as a volunteer EMT.

Erin Camp

Cornell University

Erin Camp is in her fourth year at Cornell University, working toward earning her Ph.D in Geology. She is part of the Earth-Energy Systems Integrated Graduate Education and Research Training (IGERT) program, working with Teresa Jordan and Jeff Tester. Her research focuses on sedimentary geothermal exploration and characterization from the basin-scale to the reservoir scale, using interdisciplinary methods in geology and engineering. Before attending Cornell, Erin received her Bachelor's in geology from Amherst College in 2011 and worked at the Department of Energy's Geothermal Technologies Office in Washington, D.C.

Lea-Der Chen

Texas A&M University - Corpus Christi

Lea-Der Chen is Professor and Director of the School of Engineering and Computing Sciences, and Associate Dean of Research of the College of Science and Engineering at Texas A&M University – Corpus Christi (TAMU-CC). He earned his B.S. (National Taiwan University), M.S. (Penn State) and Ph.D. (Penn State) degrees in mechanical engineering. Lea-Der has taught more than 11 different undergraduate or graduate-level courses, including development of several new courses; supervised over 60 Ph.D. and M.S. students. Chen has co-authored or authored 150+ technical publications, and is co-inventor of a US patent and an EU patent. His research was funded by the US NSF, NASA, Air Force Research Laboratory, AFOSR, ONR, TARDEC, ARDEC, TACOM, ConocoPhillips, GM, Honda, Deere & Co., Caterpillar, ISSI, CFDRC, InnerGeo, and Photon8. One of his experiments was on board of the NASA Space Shuttle Columbia of STS-87/USMP-4 Mission. His current research includes (a) harvesting energy from renewable sources such as geothermal electricity generation, microalgae biofuels, and concentrated solar thermal and concentrated photovoltaic power, and (b) alternative power sources for unmanned systems.

Jeff Dye

LoCap Energy LLC

Jeff Dye, COO of LoCap Energy, graduated from Southern Methodist University in 2012 with degrees in Environmental Studies/Sustainability and in Business from the Cox School of Business. Jeff has extensively interfaced with Maria Richards and David Blackwell at the SMU Geothermal Lab during his undergraduate years, and this experience has ignited a passion for renewable energy with a focus on waste heat & storage applications. After graduation, Jeff has excelled in a business development role while organizing Earth Day Texas (EDTx), a substantial multi-industry convention, and has effectively coordinated efforts of renewable energy industry leaders to collaborate and explore new opportunities.

Jeff has fostered a robust network in a myriad of industries and has enabled LoCap Energy to reach key business figures in Texas and around the country. He co-founded LoCap Energy with Dexter Jacobs in 2012.

Kyle Gluesenkamp

Oak Ridge National Laboratory

Kyle R. Gluesenkamp is Research and Development Staff in the Building Equipment Group at the Oak Ridge National Laboratory since obtaining his PhD at University of Maryland in 2012. He is an expert in thermodynamic cycle analysis and experimental evaluation, with research including non-vapor compression heat pumps, transcritical vapor compression heat pumps, energy efficient water heating and appliances, and appliance efficiency standards. He has published a book chapter, 18 conference and journal articles, numerous invention records, contributed to the IEA Heat Pump Program Annex 34 Final Report, and has been invited to present his work in Europe, Asia and North America for industrial and academic audiences.

Will Gosnold

University of North Dakota

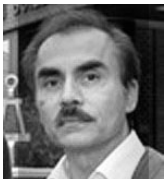
Will Gosnold is a Professor of Geophysics in the Department of Geology and Geological Engineering at University of North Dakota. He earned a baccalaureate degree in Physics from the State University of West Georgia and the Doctor of Philosophy degree in Geophysics from Southern Methodist University. In 2006 he was awarded the Chester Fritz Distinguished Professor, the highest award of the Univ. of North Dakota.

Research interests include continental sedimentary basin heat flow, borehole paleoclimatology, global change, flood frequency analysis, crust and mantle rheology, gravity signatures of geological structures, geothermal energy, and tectonics. He is directing a team of five scientists in an NSF-funded multidisciplinary project on borehole paleoclimatology, and Custodian of the Global Heat Flow Data Base of the International Heat Flow Commission of the International Association of Seismology and Physics of the Earth's Interior. He is a member of Sigma Xi, the American Geophysical Union, the European Geosciences Union, the American Association of Petroleum Geologists, and the Geological Society of America. Will is off to compete later this week in the US Masters Swimming competition.

Taylor Grysen

Ball State University

Taylor Grysen is a master's student at Ball State University, Department of Geological Sciences, graduating in May 2016. Taylor's research focuses on the Tectonics of New Caledonia using a DSDP core, examining planktonic foraminifera in the Eocene and Paleocene. Her undergraduate degree is from Ball State University in GIScience and Professional Meteorology / Climatology. Additional to her thesis she has also conducted a well log analysis project of the Illinois Basin, a bio-stratigraphic study of the Gulf Coast region, and is now working on a geothermal heat flow map of the Sumatra basin.



Rashid Hasan

Texas A&M University

A. Rashid Hasan is a Professor of Petroleum Engineering at Texas A&M University. Prior to joining TAMU, Rashid headed the Chemical Engineering Departments at University of Minnesota, Duluth (UMD) and University of North Dakota (UND) Grand Forks, and directed UND's doctoral program in Energy Engineering. He worked with the NASA Glenn Research Center on various aspects of multiphase flow and thermo-hydraulic transients. Rashid, an expert in the areas of production engineering, focuses on modeling complex transport processes in various elements of petroleum production systems. He is one of the pioneers in modeling steady and transient transport of heat and momentum in wellbores. He applies heat and fluid flow modeling to the analyses of production safety, wellbore integrity, flow assurance, geothermal well production, and pressure transient testing. His research has resulted in over 150 journal and conference publications and has authored many reports for various organizations. His book on Fluid and Heat Transfer in Wellbores is considered a definitive work in the area and is used as a text in many institutions. Hasan was the recipient of 2011 SPE Production and Operations Award and 2015 SPE Distinguished Membership Award.

Matthew Hornbach

SMU Huffington Department of Earth Sciences

Matt Hornbach earned a B.S. degree in physics from Hamilton College in 1998 and a Ph.D in geophysics from the University of Wyoming in 2004. He was a post-doctoral researcher at the Institute for Geophysics at the University of Texas at Austin from 2005-2006, and a research associate and lecturer at the University of Texas at Austin from 2006-2011. Since 2011, Matt has been an associate professor in SMU's Huffington Department of Earth Sciences. His research focuses on marine geophysics, with special emphasis on methane hydrate systems, geofluids, and quantitative geohazard analysis. His research is funded both by private industry and the U.S. government. Matt currently maintains active projects off Alaska's North Slope, The Caribbean, and multiple deep-water provinces off the U.S. eastern and western seaboards. His research has been highlighted in such journals as The Leading Edge, Geophysics, Geology, and Nature. In addition to the Dallas Geological Society, he is a member of the Geological Society of America, the American Geophysical Union, SEG, and The Tsunami Society.

Steve Hummel

EXERGY S.p.A.

Steve Hummel has been representing EXERGY S.p.A. since 2015 after having spent over 25 years in the Energy and Aerospace industries. Prior to his work with EXERGY, Steve spent five years with TAS Energy running their Renewable Solutions business with an additional 20 years of experience with GE Energy and GE Aviation. Mr. Hummel holds degrees from Virginia Tech (BS in Mech Engr), University of Cincinnati (MS Mech Engr), and Concord Law School (EJD).

Raka Islam

Texas A&M Univeristy

Raka Islam is a Master's student in the Harold Vance Department of Petroleum Engineering, Texas A & M University. She holds a B.Sc. in chemical engineering from Bangladesh University of Engineering and Technology. She works under Dr. Rashid Hasan, and her research area is heat transfer in reservoir and wellbore. She has worked for InnerGeo LLC as a summer intern and contributed to developing a model for estimating fluid temperatures in a geothermal well.

Dexter Jacobs

LoCap Energy LLC

Dexter Jacobs, CEO of LoCap Energy, graduated from Southern Methodist University in 2011 with degrees in Mathematics and Mechanical Engineering. With a background as an engineering consultant in the aerospace/automation industries and extensive project management experience, Dexter has developed a keen sense of design.

He became interested in sustainable energy systems during his senior year at SMU when discussing projects with co-founder Jeff Dye. Since then, the two have done extensive research into geothermal co-generation and other forms of waste energy harvesting and storage technologies to develop various peak shaving solutions.

Michael Jones

University of Texas at Austin

Michael Jones is currently a Master's student in the Jackson School of Geosciences at the University of Texas, Austin. Michael currently holds a B.S. in Geological Engineering and expects to receive his M.S. in Energy and Earth Resources upon completing his related thesis on the overall feasibility of wellbore heat exchangers this May. Throughout both his graduate career at UT and his undergraduate studies at the University of Mississippi, Michael has participated in many extra-curricular events relating to the field of geothermal energy including:

- 2013 National Geothermal Academy (University of Nevada, Reno)
- 2014 DOE sponsored GeoEnergy is Beautiful infographic design competition (3rd place)
- 2016 Blade Energy Geothermal II Project
- Geothermal conference attendance (SMU 2015 Power Plays & Geothermal Resources Council 2014 Annual Meeting).

Kevin Kerlin

Helidyne, LLC

Kevin Kerlin co-founded Helidyne in 2008 with the goal to develop and commercialize the planetary rotor expander concept. He began his career in 2003 working as a Mechanical Engineer at Raser Technologies within their R&D department. Learning from his experience at Raser, Kevin became an expert in CAD/CAM programming and CNC machining to better facilitate prototyping efforts at Helidyne. As Helidyne matured, he was responsible for raising the first round of equity capital in 2012, as well as retaining its first customer contract in 2013. As CEO, he focuses on team building, strategic planning, raising growth capital, and increasing revenue. Kevin holds a B.S. degree in Mechanical Engineering from the University of Utah and a MBA from Southern Utah University.

Peter Malin

Advanced Seismic Instrumentation and Research, LLC

Peter Malin is Director of Development for ASIR. He brings more than 40 years of experience in borehole seismology, instrument design and installation, seismic monitoring, and fracture research. Peter has been responsible for the design, installation and monitoring in sites worldwide, including USA, New Zealand, Iceland, Kenya, Taiwan, Turkey, Switzerland, Caribbean, Israel, Japan, Central America, Saudi Arabia and China. He was instrumental in the seismic monitoring network at the San Andreas Fault Observatory at Depth (SAFOD), resulting in the discovery of a new type of seismic wave in fault. Peter founded Sondi in California and serves as Director of The Institute of Earth Science and Engineering , a research and development institute in Auckland, New Zealand. Peter led the Institute in the study of the crust's active tectonic and hydrothermal systems, and developed new modes of data gathering, modeling and instrumentation. Focal interests of Peter's work have included fault zone guided waves and the interaction of faults and fractures with subsurface fluids, along with the study of "joint geophysical imaging" of fracture zones using seismic, electromagnetic, and potential field methods. More recent work has centered on fracture permeability enhancement. PhD Geophysics, Princeton University; MS Marine Geophysics, Stanford University; BS Geophysics, Stanford University.

Josh Mengers

U. S. DOE Geothermal Technologies Office

Josh is the hybrid systems technology manager in the Geothermal Technologies Office at the Department of Energy headquarters in Washington, DC. He also leads the office's technology to market activities, which include the SBIR/STTR program, the Small Business Vouchers Pilot, and other activities that focus on commercialization. He came to the Department as a Presidential Management Fellow in the summer of 2012. Before that Josh earned his PhD in aerospace and mechanical engineering from the University of Notre Dame focusing on thermodynamic modeling. Josh is a veteran having served as an officer in the U.S. Army after his undergraduate education at Johns Hopkins University.

Randy Normann
Perma Works LLC

Randy Normann, Chief Technology Officer of Perma Works, received his undergraduate degree from Oregon Institute of Technology, OIT. OIT is this nation's first geothermal heated campus. He received his MS EEC from Univ. of New Mexico. Randy joined Perma Works to manufacture the world's only electronic geothermal well monitoring system rated for 275°C+. Before Perma Works, Randy was in Sandia National Laboratory's Geothermal Research Dept. as the lead investigator for High-Temperature Electronics and Fiber Optics development. He has been the General Co-Chair for the High-Temperature Electronics Conference for over 12 years and a long term member of the European High-Temperature Network, HITEN. Randy currently serves as the Working Group Convener for High-Temperature Tools under the International Partnership for Geothermal Technology led by the DOE's Geothermal Technologies Program. In the area of high-temperature battery research, he received an R & D 100 award in 2006 for the first ever 250°C battery. Randy was the DOE technical lead on the Honeywell, Deep Trek Project developing new HT SOI electronics. He is a contributing author to the book, "Extreme Environmental Electronics."

Simone Passera
Turboden s.r.l.

Simone Passera holds a PhD in Materials for Engineering and a MS in Mechanical Engineering from the University of Italy, Brescia. After graduation he worked in Mexico as a University researcher at Advanced Technology Center for Production (CETEC), Tecnologico de Monterrey. Simone has worked for Turboden since 2012 based in both Italy and the United States, with his sales region located in Central American markets (Mexico, Central America, Caribbean and Colombia).

Simone focuses on waste heat recovery solutions (from gas turbines, reciprocating engines, intensive energy industrial processes such as cement, steel and glass). During project development, Simone works with the engineering department to find suitable technical solutions for a project.

An achievement of Simone's is accomplishing the first ORC based biomass power plant (7.5 MW electric power output) in an integrated pellet plant in the U.S.

Susan Petty

AltaRock Energy, Inc.

Susan Petty is the chief technology officer, president, and co-founder of AltaRock Energy, Inc. With more than 30 years of experience in the geothermal industry, Susan's work has included all aspects of testing, evaluation, analysis, modeling and optimization for geothermal wells, wellfields and powerplants. She has also negotiated geothermal lease agreements, power sales agreements, geothermal project financing agreements and geothermal property sales and purchases, and completed policy studies for state and federal agencies. Susan has driven geothermal electrical generation projects in locations around the world, including: California, Nevada, Indonesia, the Philippines and Central America.

In addition to her extensive experience in the private sector, Susan has worked with the Department of Energy in performing policy studies on the economic modeling of geothermal pricing, and the impact of technology improvement on the cost of geothermal power. She has been instrumental in developing information, planning and designing software for use in developing public policy in geothermal energy.

Susan holds a B.A. from Princeton University in Geology, and an M.S. in Groundwater Hydrology from the University of Hawaii.

Satish Ravindran

Houston Advanced Research Center (HARC)

Satish Ravindran is a Senior Research Associate at HARC. He graduated with his Master's degree in Industrial Engineering from Texas A&M University, College Station in 2009. Satish is a registered Professional Engineer in the State of Texas , a Certified Energy Manager and a LEED Green Associate. He works primarily on Combined Heat and Power (CHP) projects and provides technical support to the Department of Energy CHP Southwest Technical Assistance Partnership. He conducts feasibility studies and analysis related to CHP, district heating, and waste heat recovery. Satish also works on waste heat recovery projects for the Environmental Friendly Drilling Systems (EFD) program at HARC, and energy efficiency projects, which includes the City of Houston. He has over six years of experience in the field of energy efficiency and HVAC.

Tim Reinhardt

US DOE Geothemal Technologies Office

Tim Reinhardt is currently at the Department of Energy (DOE) in the Geothermal Technologies Office (GTO) as a physical scientist and Program Manager for the Systems Analysis and Low-Temperature (SALT) Programs. Tim provides oversight and program guidance for demonstration, R&D, feasibility and analysis projects; as well as direction for future GTO activities.

The GTO is committed to developing and deploying a portfolio of innovative technologies for clean, domestic power generation. The Office researches, develops, and validates innovative and cost-competitive technologies and tools to locate, access, and develop geothermal resources in the United States.

Tim received his bachelor's degree from Northwestern University. He served in the United States Navy for nine years as an officer and Naval Aviator, and holds Master's Degrees from the University of Oklahoma and the University of Texas at Austin.

Maria Richards

SMU Geothermal Laboratory

Maria Richards is the SMU Geothermal Laboratory Coordinator in the Huffington Department of Earth Sciences. Her research is on geothermal resources and energy development. Projects vary from computer generated temperature-depth maps for Google.org to on-site geothermal exploration of the volcanic islands in the Northern Mariana Islands. Currently her concentration is on the conversion of oil/gas wells into geothermal energy producers. Along with Cathy Chickering Pace, she coordinates the SMU Node of the National Geothermal Data System funded by the Department of Energy. Past research includes the Eastern Texas Geothermal Assessment, Geothermal Map of North America, Dixie Valley Synthesis, and the resource assessment for the MIT Report on the Future of Geothermal Energy. Maria is President-Elect of the Geothermal Resources Council Board of Directors. She is a Named Director of the 2015-16 Board for the Texas Renewable Energy Industries Alliance (TREIA). Maria holds a Master of Science degree in Physical Geography from the University of Tennessee, Knoxville and a BS in Environmental Geography from Michigan State University.

Chris Ruffer

Houston Advanced Research Center (HARC)

Chris Ruffer is a Research Assistant at the Houston Advanced Research Center working with the Environmentally Friendly Drilling (EFD) Program. He graduated with a Master's degree in Petroleum Engineering from Louisiana State University where he focused on Reservoir Engineering and Reserve Estimation. He also holds a Bachelor's degree in Petroleum Engineering from Texas Tech University. Chris has been involved with several research projects and field trials since joining HARC in mid 2014 as a Research Intern. He works on projects involving research into technologies that mitigate natural gas flaring at the well site, using membranes to treat produced water, and engine emissions testing for engines used during drilling and hydraulic fracturing operations.

John Sisler

2Phase Sensors, University of Auckland

John Sisler is a mechanical engineer with more than 30 years' experience in electrical product design. He has a Master degree from University of Auckland with specific study in Geothermal Energy, and a BS degree from University of California, Davis.

His background includes product development at many electronics companies in Silicon Valley, with an expertise in mechanical design and electromagnetics.

PV (Suri) Suryanarayana

Blade Energy Partners

As a founding partner of Blade Energy Parners, Suri is President and CEO. He has 22 years of experience in the energy industry, including an extensive background in tubular mechanics, thermal problems, multiphase flow modeling and probabilistic design (Quantitative Risk Analysis) techniques. Suri is a lead instructor for Blade in their Advanced Thermal Well Design and Advanced Casing and Tubing Design courses. He has extensive experience in the design, engineering and implementation of complex UBD projects and critical wells, including High Pressure High Temperature, Extended Reach and Deepwater wells. The underlying theme of his professional career has been solving unique engineering problems and developing new technologies and solutions in the energy industry. Lately, he has been very active in alternative energy engineering, thermal and geothermal well engineering, reliability-based design and quantitative risk analysis, and quantitative assessment of formation damage. A member of SPE and ASME, he has authored or co-authored over 50 archival papers in the industry. Suri served as an SPE Distinguished Lecturer in 2006-07, and received the SPE Regional Drilling Engineering award for the Mid-continent region in 2013. Education credits include a PhD in Mechanical Engineering from Rice University.

Craig Turchi

National Renewable Energy Laboratory (NREL)

Dr. Turchi is a senior engineer within NREL's Thermal Systems Group. Craig began his career with NREL in 1990 working in the Solar Industrial Program. From 1996 to 2008 he worked in the private sector with Zentox Corporation, a manufacturer of air- and water-treatment equipment, and ADA Technologies Inc., a technology development company. While at ADA, Craig led the company's Water Treatment research group. Craig returned to NREL in 2008, where he joined the Thermal Systems Group to lead the Concentrating Solar Power systems analysis task. Here his team investigates energy-conversion technologies and novel applications of solar thermal energy. In 2014, Craig's role expanded to include direct-use applications of geothermal energy and geothermal/solar-thermal hybrid plant modeling. Craig has a Ph.D. in chemical engineering, from North Carolina State University, and a B.S. in chemical engineering from Texas A&M University.

Doug Waples

Sirius Exploration Geochemistry

Douglas Waples received his PhD in physical organic chemistry from Stanford University, but shifted his emphasis to petroleum geochemistry during postdoctoral fellowships in West Germany and Chile. He started his career with Chevron, where he was one of the first to apply maturity modeling to oil exploration. Subsequently, he taught at the Colorado School of Mines and worked for Mobil. Since 1983 he has been an independent consultant to oil companies in numerous countries. His assignments have covered much of the world, and include long-term relationships with JNOC in Japan, Petronas in Malaysia, Maersk in Denmark, Pemex in Mexico, and PTTEP in Thailand. Doug lived in Japan for three years as a researcher for JNOC. He has participated in development of several types of commercial software for basin modeling. His publications include three books and about 90 papers and chapters on geochemistry and basin modeling, one of which won the 1982 Sproule Award from the AAPG. He also received the Rocky Mountain Association of Geologists Outstanding Scientist award for 2012. Over the past 30+ years Doug has taught short courses and university courses in geochemistry and basin modeling in English or Spanish in 25 countries on six continents. Doug is currently president and chief scientist for Sirius Exploration Geochemistry in Evergreen, Colorado.

Tom A. Williams

National Renewable Energy Laboratory (NREL)

As Laboratory Program Manager of Geothermal Technologies, Tom Williams has over three decades of experience in renewable energy R&D that encompasses:

- Assessment of new technologies from technical, economic, and business perspectives
- Development of Geothermal and Concentrating Solar Power technologies as the leader of NREL's R&D programs in these areas
- Commercializing laboratory developments through intellectual property transactions and collaborations ranging from pre-venture companies to Fortune 50 firms
- Leadership of multidisciplinary teams working in all of the above areas.

His educational background includes a B.S. in Chemical Engineering and an MBA from the University of Washington.

Aaron D. Wilson

Idaho National Laboratory (INL)

Aaron D. Wilson is a research chemist with over 15 years of experience in industry, academics, and government laboratories. As a Ph.D. graduate student at the University of Colorado Boulder he worked in collaboration with researchers at the National Renewable Energy Laboratory and Pacific Northwest National Laboratory on the thermodynamics of homogeneous electrocatalysts. He completed postdoctoral appointments at California Institute of Technology and the National Institutes of Health. As of winter 2015, Wilson's work is documented in 19 peer-reviewed journal articles which together have more than 900 citations. He has been awarded one patent and has two active patent applications. Since arriving at INL in 2010, he has been the principal investigator on several projects in materials chemistry and chemical separation processes. His work ranges from fundamental solution theory to the design of pilot water treatment systems. He is currently pioneering the Switchable Polarity Solvents Forward Osmosis water treatment system which has resulted in multiple recognitions including a 2013 R&D 100 award. Wilson has been awarded multiple INL Laboratory Director Awards and was given the INL Early Career Exceptional Achievement Award for 2013.

Richard L. Wynn

Deep River Group, LLC

Richard L. Wynn is the founder of the Deep River Group of companies advancing alternative energy applications and E&P generated waste recycling services. He is an independent oil and gas geologist with over three decades of experience in oil and gas exploration and well-site operations, encompassing all major basins in the mid-continent USA.

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