

Agenda

Presented by Jay Egg

Applying the Laws of Thermodynamics to Geothermal Heat Pumps (GHPs) and Indoor Thermal Comfort

Applying the laws of thermodynamics to HVAC systems
Understanding the refrigeration cycle
Calculating heating and cooling loads
The effect of air flow and insulation
How comfort is measured
Understanding efficiency

Understanding Earth Loop Systems

The hidden assets of geothermal technologies
Solar energy in the Earth
Architecture of closed loop systems

- Horizontal ground loops
- Direct exchange systems
- Mini-grids
- Vertical ground loops
- Thermal load sharing

Applications for open loop (Class V Thermal Exchange) systems

- Single well
- Two-well systems

Evaluating topography
Measuring soil conductivity
Environments for ground-loop systems: beneath yards, fields, parking lots, and buildings

Designing Geothermal Systems

Determining loop type

Making heat loss calculations

Sizing the unit

Sizing the loop

Writing a request for proposal (RFP)

Writing a driller specification

HS2 hydronic design software

Choosing System Type

Distributed GHPs or chiller plants

Basic components of geothermal heat pump (GHP) systems:

Pumps, condenser water piping, heat pump, heat exchanger

Forced air systems

Hydronic systems

Domestic hot water options

Geothermal swimming pool heaters

Evaluating the Benefits of Geothermal Systems

Incentives to use geothermal

Geothermal utilities

Measuring performance

Calculating savings and cost

Environmental benefits

Tax credits, incentives and rebates

Property Assessed Clean Energy (PACE)

State-based legislation

Maintaining Geothermal Systems

Performing routine maintenance on GHPs

Loop maintenance (automatic or periodic)

Pump maintenance/monitoring

Geothermal Heating and Cooling: Technology and Applications
Ronkonkoma, NY - Thursday, February 14, 2019

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Learning Objectives

You'll be able to:

Apply the laws of thermodynamics to HVAC systems.

Calculate costs and savings of geothermal systems.

Evaluate topography and measure soil conductivity.

Determine loop types, including open loops and vertical and horizontal closed loops.

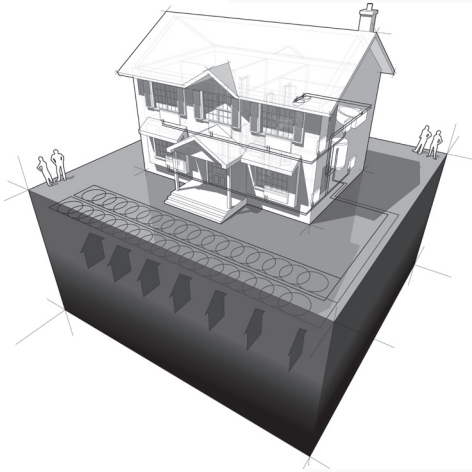
Choose system components, including heat pumps, water pumps and piping.

Perform routine maintenance on geothermal heat pumps.



Geothermal Heating and Cooling: Technology and Applications

Ronkonkoma, NY - Thursday, February 14, 2019



Understand earth loop systems

Identify the environmental and economic benefits of geothermal systems

Learn how to make heat loss calculations

Explore vertical and horizontal closed loop systems

Learn about designing forced air and hydronic systems

Discuss how to maintain geothermal systems

Continuing Education Credits

Professional Engineers
6.5 Continuing Ed. Hours

Contractors
Non-Credit Continuing Ed.

Architects
6.5 HSW Continuing Ed. Hours
6.5 AIA HSW Learning Units



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Faculty

Jay Egg *Founder and Consultant with Egg Geothermal*

Mr. Egg founded Egg Geothermal in 1990 to provide renewable energy systems to the public. As a result of the American Recovery and Reinvestment Act of 2009, Mr. Egg wrote two books for McGraw-Hill Education, and Egg Geothermal entered into a new age of acceptance. Mr. Egg currently focuses his professional efforts as a renewable energy expert on renewable and sustainable energy, and on solar and geothermal exchange implementation. Among his clients are international, federal, state and local governments; developers; associations; and private entities. Egg Geothermal is a training and curriculum facilitator for the U.S. Department of Energy (DOE) and the “Geothermal Workshop Series,” serving the GeoExchange Organization/ American Ground Water Trust and the National Ground Water Association.

Here’s what past attendees had to say about the program and instructor Jay Egg:

“Very effective presenter with first hand knowledge of his subject.” – *Professional Engineer*

“Great examples of creative applications of the technology.” – *Engineer*

Seminar Information

Courtyard by Marriott Long Island MacArthur Airport 5000 Express Drive South Ronkonkoma, NY 11779 (631) 612-5000	Registration 8:00 - 8:30 am Morning Session 8:30 am - 12:30 pm	Lunch (On your own) 12:30 - 1:30 pm Afternoon Session 1:30 - 4:30 pm
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Tuition

\$279 for individual registration

\$259 for three or more simultaneous registrations.

Included with your registration: *Complimentary continental breakfast and printed seminar manual.*

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar. You may also send another person to take your place.

Additional Learning

Webinar Series

Commercial Solar Peaker Batteries

- **Commercial Solar Peaker Batteries, Part I**
Wed., Jan. 9, 2019, 11:00 AM - 3:15 PM CST
- **Commercial Solar Peaker Batteries, Part II**
Thurs., Jan. 10, 2019, 11:00 AM - 2:15 PM CST

Proposal Writing

Fri., Jan. 11, 2019, 11:00 AM - 3:30 PM CDT

Technical Writing

- **Technical Writing Basics**
Mon., Jan. 14, 2019, 11:00 AM - 1:00 PM CST
- **Planning Documents**
Mon., Jan. 14, 2019, 1:30 - 3:30 PM CST
- **Writing Documents**
Tues., Jan. 15, 2019, 11:00 AM - 1:00 PM CST
- **Revising and Editing Documents**
Tues., Jan. 15, 2019, 1:30 - 3:30 PM CST

For more information visit:
www.halfmoonseminars.org/webinars/

Continuing Education Credit Information

This seminar is open to the public and offers up to 6.5 continuing education hours to professional engineers and 6.5 HSW continuing education hours to architects in all states.

HalfMoon Education is an approved continuing education provider for New York engineers (NYSED Sponsor No. 35) and New Jersey engineers (Approval No. 24GP00000700). HalfMoon Education is deemed a New York-approved continuing education provider for architects via its affiliation with the American Institute of Architects.

This event is approved by the American Institute of Architects for 6.5 HSW Learning Units (Sponsor No. J885). Courses approved by the AIA qualify for New Jersey architects. Only full attendance can be reported to the AIA/CES.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, North Carolina, and North Dakota.

This event offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any state with a continuing education requirement for contractors.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Fiber-Reinforced Composites

- **Portland Cement and Masonry**
Thurs., Jan. 17, 2019, 11:00 AM - 1:00 PM CST
- **Fiber-Reinforced Composites**
Thurs., Jan. 17, 2019, 1:30 - 3:30 PM CST
- **Fiber-Reinforced Polymer (FRP) Composites Reinforcement**
Fri., Jan. 18, 2019, 11:00 AM - 1:00 PM CST
- **Overview of Sandwich Materials and Structures**
Fri., Jan. 18, 2019, 1:30 - 3:30 PM CST

Pumping and Piping Systems

- **Introduction to Pumps: Operation, Principles and Calculations**
Thurs., Jan. 24, 2019, 12:00 - 2:00 PM CST
- **Design Standards and Codes**
Thurs., Jan. 24, 2019, 2:30 - 3:30 PM CST
- **Piping System Components, Materials and Calculations**
Fri., Jan. 25, 2019, 12:00 - 2:00 PM CST
- **Handling Pump and Piping System Problems**
Fri., Jan. 25, 2019, 2:30 - 3:30 PM CST

Registration

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Complete the entire form. Attach duplicates if necessary.	
Registrant Information Name: _____ Company/Firm: _____ Address: _____ City: _____ State: _____ Zip: _____ Occupation: _____ Email: _____ Phone: _____ Additional Registrants: Name: _____ Occupation: _____ Email: _____ Phone: _____ Name: _____ Occupation: _____ Email: _____ Phone: _____ Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred. () I need special accommodations. Please contact me.	

Tuition

() **I will be attending the live seminar.** Single Registrant - **\$279.00**. Three or more registrants from the same company registering at the same time - **\$259.00** each.

Checks: Make payable to HalfMoon Education Inc.

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