



# Granite State Geologist

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## MAYEWSKI SPEAKS AT GSNH 2009 WINTER DINNER MEETING



The GSNH was pleased to welcome Dr. Paul Mayewski as our Winter 2009 Dinner guest speaker. His talk that evening entitled “*Climate Change: Perspective, Surprises and Opportunities*” drew some 100 members and guests to Alan’s Restaurant in Boscawen. Paul is currently the Director of and Professor at the Climate Change Institute, and Professor of Earth Sciences at the University of Maine, Orono. His numerous explorations and research projects have brought him world wide recognition in the fields of climate study. Professor Paul Mayewski has had a long and distinguished career conducting climate change research in Antarctica. Paul’s primary research interests are climate change and change in the chemistry of the atmosphere. His research has included collecting snow samples and ice cores not only from the Antarctica, but also in the Arctic, the Andes, New Zealand and the Himalayas and Tibetan Plateau. He is the founder and Chair of the Executive Committee for the International Trans-Antarctic Scientific Expedition (ITASE), which is reconstructing the Antarctic climate and chemistry of the atmosphere for the last 200 years. Paul has led more than 35 scientific expeditions to the Antarctic, where a mountain peak is named for him and where he explored uncharted territories.

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## MESSAGE FROM THE PRESIDENT

As some of you may know, we broke into triple digits (100 attendees) at the January 8<sup>th</sup> GSNH meeting. In addition, this despite the need for a last-minute switch of venue from Concord to Boscawen when the unexpected closing of the Cat 'n Fiddle forced us to find another restaurant on short notice. The strategic placement of Ralph Wickson in the Cat 'n Fiddle parking lot ensured that no one was left behind or unfed. Paul Mayewski's talk on climate change was obviously a big hit, even though while he discussed melting glaciers in the Antarctic we have been experiencing the snowiest winter in three years (as per official weather data).

We are looking forward to moving into spring with another out-of-state visiting speaker, Christopher Laughrey, from the Oil, Gas, and Subsurface Geological Services group of the Pennsylvania DCNR. As noted elsewhere in the Newsletter, he will be speaking on the Marcellus Shale natural gas formation at our new location, the Red Blazer Restaurant just down the street from the Cat 'n Fiddle. Be sure to note the date change from the original April 9<sup>th</sup> to April 16<sup>th</sup>. Planning is still underway for this summer's field trip, so stay tuned!

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## NHGS LUNCHTIME LECTURES

On Thursday, January 8, 2009 some 120 DES and outside guests attended the New Hampshire Geological Survey's Lunchtime Lecture Series, held at the DES Auditorium in Concord, NH. Paul A. Mayewski, Ph.D., Director and Professor, Climate Change Institute and Professor, Dept. of Earth Sciences, University of ME, Orono, spoke on "*Abrupt Climate Change: Past, Present and Future*". Dr. Mayewski's primary research interests are climate change and change in the chemistry of the atmosphere. He has pursued these interests by collecting snow samples and ice cores from throughout Antarctica, the Arctic, Andes, New Zealand and the Himalayas and Tibetan Plateau. Paul explained the discovery of abrupt climate change as it relates to Pleistocene and Holocene events. What is forcing these changes, and what is their significance for the future? For more on Dr. Mayewski's extensive work go to the following website: <http://www.climatechange.umaine.edu/Directory/people/mayewski.html>.

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## UNH PROFESSOR WALLY BOTHNER RETIRES



Wally Bothner, Professor of Geology in the Department of Earth Sciences at UNH, retired in January after 41 years of service. Wally is well known for his work deciphering the structural and tectonic history of New England and was instrumental in compiling the most recent state geological map of New Hampshire. He mentored numerous students and faculty at UNH, many of whom have themselves gone on to successful careers in the geosciences. As an Emeritus faculty member, Wally will be continuing recent mapping projects in the region and restoring one of the three remaining wall-sized relief maps prepared by New Hampshire's first State Geologist, Professor Charles H. Hitchcock, for display in the newly renovated James Hall.

## NEIGC 2009 TRIP LEADERS NEEDED

The planning for NEIGC 2009 is underway. Alison Lathrop, Bud Ebbett and Dave Westerman have agreed to organize the 2009 meeting, sponsored by Lyndonville State College, Norwich University and the Vermont Geological Survey. The meeting will be held during the last weekend of September in the Northeast Kingdom of Vermont and the surrounding area, with headquarters in Lyndonville. If you have research of your own that you would like to share, or know someone whose arm we should be tugging on or twisting, please let one of us know. Trip opportunities as far a field as southeastern Quebec, northern New Hampshire and central Vermont will certainly be considered. We hope to hear from a number of you soon! Dave Westerman (802) 485-2337 or [westy@norwich.edu](mailto:westy@norwich.edu) or go to the website <http://w3.salemstate.edu/~lhanson/NEIGC/>.

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## THE OLD MAN OF THE MOUNTAIN LEGACY FUND

The Old Man of the Mountain Legacy fund was formed to create a lasting legacy of remembrance for New Hampshire's most famous symbol, the granite profile in Franconia Notch, which watched over New Hampshire until May 3, 2003. To see details of what the Legacy Fund currently plans, see: <http://www.oldmanofthemountainlegacyfund.org/#> This site also has an animated video of what the memorial site at Profile Lake will look like and how it will "work" to recreate the Old Man Profile.

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## NEW NH-VT USGS E-MAIL NOTIFICATION LIST

The New Hampshire-Vermont Water Science Center of the US Geological Survey (USGS) is announcing that they are initiating an email notification system of new reports, information and other products. The purpose of occasional emails will be used to keep interested persons up-to-date on the results of the diverse water resource investigations and data collection efforts going on by the USGS NH-VT office. The NH-VT USGS has compiled an email distribution list based on persons who have routinely contacted the Water Science Center, past mailing lists, and the email distribution lists of some of our partners. If you think you are on the list and would like to be removed from this notification list, or would like to add others, please contact the NH-VT USGS office. Additional information on our on-going and recently completed projects, real-time streamflow data and conditions, and groundwater levels, can be found on our web page located at: <http://nh.water.usgs.gov>. Feel free to contact Keith Robinson, Director, USGS, NH/VT Water Science Center, 361 Commerce Way, Pembroke, NH 03275603-226-7807 or by email to Keith at [kwrobins@usgs.gov](mailto:kwrobins@usgs.gov)<http://nh.water.usgs.gov>. Printed copies can be obtained by contacting Sky Merritz at [smerritz@usgs.gov](mailto:smerritz@usgs.gov) or 603-226-7851. Some recently completed NH-VT USGS reports are:

*Flood of April 2007 in New Hampshire* by Robert H. Flynn, USGS Scientific Investigations Report 2008-5120 (Printed copies available).

*Bedrock, Borehole, and Water-Quality Characterization of a Methane-Producing Water Well in Wolfeboro, New Hampshire*, by James R. Degnan, Gregory J. Walsh, Sarah Flanagan, and Robert C. Burruss, USGS Open-File Report 2008-1333. (On-line only)

*Selected-Water and Sediment-Quality, Aquatic Biology, and Mine-Waste Data from the Ely Copper Mine Superfund Site, Vershire, VT, 1998-2007*, by Denise M. Argue, Richard G. Kiah, Nadine M. Piatak, Robert R. Seal II, Jane M. Hammarstrom, Edward Hathaway, and James F. Coles, USGS Data Series 378. (On-line only)

*Measured River Leakages Using Conventional Streamflow Techniques: The Case of Souhegan River, New Hampshire, USA*, by Philip T. Harte and Richard G. Kiah. *Hydrogeology Journal* (Printed copies available).

*Characterization of total mercury and methylmercury cycling at five sites using the small watershed approach*, by James B. Shanley, M. Alisa Mast, Donald H. Campbell, George R. Aiken, David P. Krabbenhoft, Randall J. Hunt, John F. Walker, Paul F. Schuster, Ann Chalmers, Brent T. Aulenbach, Norman E. Peters, Mark Marvin-DiPasquale, David W. Clow and Martin M. Shafer, *Environmental Pollution, Volume 154, Issue 1, July 2008*, p 143-154. (Printed copies available).

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## **NHGS FALL-WINTER GROUNDWATER LEVELS**

Ground-water level measurements for December 2008 and January and February 2009 were collected by NHGS staff members Genevieve Al-Egaily and/or Kristen Svendsen.

December 22<sup>nd</sup> - 24<sup>th</sup> - The statewide average ground-water level showed a 0.85-foot increase from November. Increases were seen in all wells except for the Lee well and the well at the Concord airport, which had decreases of 0.70 and 0.09 feet respectively. When compared with December 2007, the statewide average ground water level increased 1.65 feet. Increases were also seen in all wells except for the Lisbon and Colebrook wells, which had decreases of 0.08 and 0.44 feet respectively

January 21<sup>st</sup> - 23<sup>rd</sup> - The statewide average ground-water level showed a 0.52-foot decrease from December. When compared with January 2008, the statewide average ground water level increased 0.86 feet.

February 23<sup>rd</sup> - 26<sup>th</sup> - The statewide average ground-water level showed a 0.56-foot decrease from January. Decreases were seen in all wells except for Lee, which showed an increase of 0.11 feet. When compared with February 2008, the statewide average ground water level decreased 0.29 feet. The data does not include the measurement for the well at Lisbon because of access issues (snow piles).

If you would like to view historical groundwater data, please go to <http://nh.water.usgs.gov/WaterData>

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## **CLASSROOM ENHANCEMENT GRANTS**

Teachers across the state of New Hampshire are invited to submit proposals for a grant of funds (up to \$300) to support the purchase of earth-science related teaching materials (equipment or supplies) for use in the classroom. Please pass this along to a teacher/class you know that would benefit from this grant and send your proposal to the GSNH at <http://gsnh.org/outreach/grant.shtml>.

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## **TIDAL ENERGY COMMISSION HOUSE BILL 694**

On June 25, 2007 Governor Lynch signed HB 694 (Chapter 222, Laws of 2007) establishing a Commission to study the feasibility of tidal (hydrokinetic) power generation under the Little Bay and General Sullivan Bridges, located in Dover and Newington. This document represents a summary of the final report of the Commission. A copy of the entire HB 694 NH Tidal Energy Commission Final Report is available from the NHDES Coastal Program website:

## GSNH MEMBERSHIP REMINDERS

Do we have your current contact information and e-mail address? Often times we need to reach you quickly about a change in an event. The recent 2008 summer field trip (which was cancelled last minute due to rough seas) and the 2008-2009 winter dinner meeting (restaurant closing!) are good examples. The GSNH tries to contact all members with change information via email and/or telephone. However, we can only reach you if we have your current e-mail address and/or telephone number. Also, the 2008-2009 GSNH Membership Directory is being published soon. Those with a current GSNH membership will be included in the directory. Your GSNH membership runs for a calendar year. You can check your membership status by looking at the mailing label of your newsletter or contacting the GSNH membership chairman. If you need to renew your membership or download a form go to [www.gsnh.org](http://www.gsnh.org). Any contact information that needs to be changed please contact GSNH Membership Committee chairman Doug Allen at: [dallen@HaleyAldrich.com](mailto:dallen@HaleyAldrich.com).

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## UPCOMING EVENTS AND DATES TO REMEMBER

**March 22-24, 2009:** GSA Northeast Sectional Meeting, Portland, Maine

**April 16, 2009:** GSNH Spring Dinner Meeting, Red Blazer Restaurant, Concord, NH (**NEW LOCATION**)

**May 5, 2009:** 2009 BIA/NHDES Waste Management Seminar (a.k.a.Consultant's Day) at the Center of New Hampshire in Manchester.

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## MINERAL RAFFLE WINNERS AND DONATION THANKS

Thank you to Bob Whitmore and to the UNH Earth Sciences Department for donating minerals during the recent GSNH winter dinner meeting. The winners were: Doug Allen (Biotite with Smokey Quartz), Russ Wilder (Galena Crystal on Quartz) and Matt Snow (Aragonite). Congratulations to the lucky winners and many thanks again to the donors!

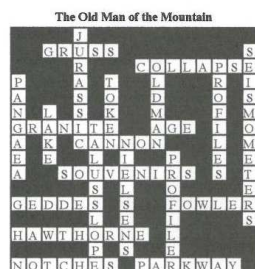
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## GSNH 2009 SPRING DINNER MEETING



As many of you are aware, the Cat-n-Fiddle Restaurant was recently sold and closed. The 2009 winter GSNH meeting was moved to Alan's Restaurant in Boscowen at the last minute. We have found a new dinner meeting place – The Red Blazer Restaurant located at 72 Manchester Street in Concord, New Hampshire. It is just a few steps down the street from the Cat-N-Fiddle. So, please note the new meeting location for the April meeting. For more information on the Red Blazer and directions go to their website at [www.theredblazer.com/directions.html](http://www.theredblazer.com/directions.html).

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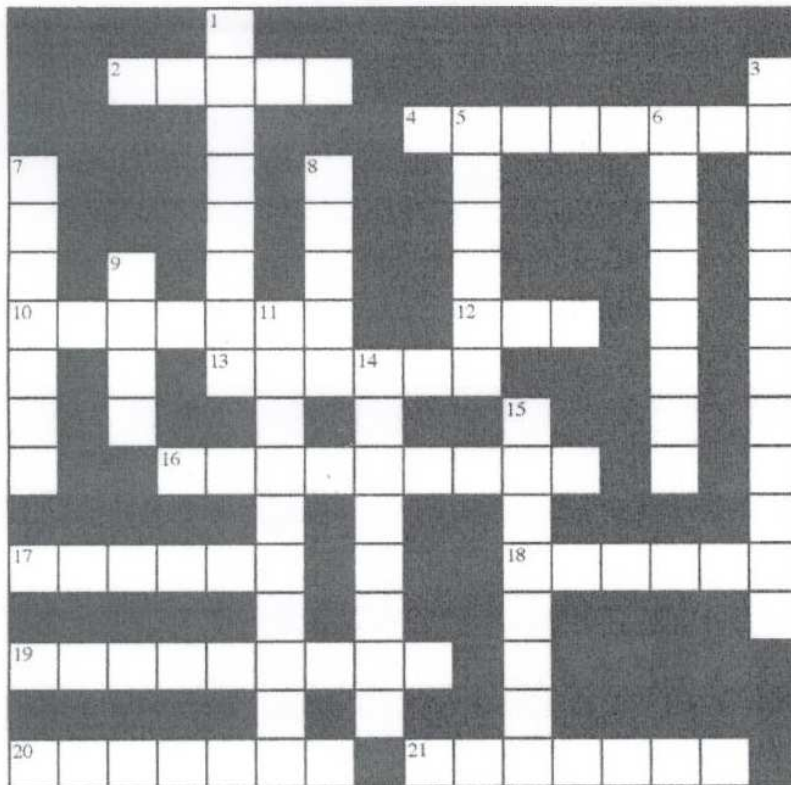
Crossword puzzle answer. Don't peak!

# GEO CROSSWORD PUZZLE

(Answers on Page 8)

## The Old Man of the Mountain

GSNH Education Committee



### ACROSS

- 2. Formed from the weathering of granite
- 4. Overnight of May 2-3, 2003
- 10. Rock type
- 12. At least from 1805 to 2003
- 13. Old Man's Mountain
- 16. Countless take-home replicas
- 17. Installed first turnbuckle in 1916
- 18. Structural surveyor

- of the Old Man
- 19. "The Great Stone Face"
- 20. Franconia, Crawford, Jefferson, Pinkham, etc.
- 21. Construction thought to threaten Old Man

### DOWN

- 1. Age of the Conway Granite
- 3. Used to detect Parkway

construction vibrations

- 5. NH's state symbol (3,3)
- 6. Indian Head, Washington Lying in State and the Sleeping Astronomer
- 7. Massive rifting, allowing Conway Granite to rise up into the crust
- 8. Old Man's "legal tender"
- 9. Old Man Memorial to be located on the shore of Profile

- 11. Old Man's "resting place" (5,5)
- 14. Family of "caretakers"
- 15. Device to recreate Old Man's "outline"

# Energy Myths and Realities

Because of who you are and what you do, no doubt you've been asked about oil prices and the current energy situation.

And no doubt, the conversations will continue.

Interestingly, recent Gallup polls show 57 percent of Americans want increased domestic drilling and only 20 percent believe 'big oil' is the major problem. That is quite a turnaround from years past.

But there are a lot of questions still to be answered – and erroneous conclusions abound.



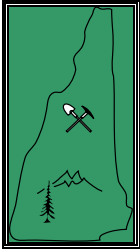
Tinker

AAPG President **Scott Tinker** has been answering a lot of these questions in his position as director of Bureau of Economic Geology at the University of Texas at Austin, and has been giving talks and writing op-ed pieces on “Energy Myths and Realities.”

The following is a “Top 10 List” of the myths and realities he has presented as talking points as the conversations come up. Some “myths” and the “realities” are offered below.

Myth	Reality
1. The United States can be energy independent in the next 25 years.	<ul style="list-style-type: none"> <li>• The world is “flattening;” commodity interdependence is becoming the norm.</li> <li>• Energy infrastructure transitions take time and are very expensive (\$ trillions).</li> <li>• The United States imports over 30 percent of its energy, mostly as oil, and the trend is increasing.</li> <li>• Independence requires realistic, scalable alternatives, which do not currently exist but can be developed over several decades.</li> </ul>
2. “Renewable energy” can reduce dependence on fossil fuels significantly in the next 25 years.	<ul style="list-style-type: none"> <li>• Energy is not renewable –some sources of motion (wind &amp; water), light (solar) and fuel (crops) seem “continuous” on human time scales.</li> <li>• Intermittent sources (solar, wind) are cleaner, less reliable, more expensive, and represent less than 1 percent of the energy mix.</li> <li>• Base load fuels (coal, natural gas, nuclear) are dirtier, more reliable, and cheaper.</li> <li>• Decarbonization of the energy mix has been happening for over 150 years, but increased demand for coal in China and elsewhere is beginning to change that.</li> <li>• The consumer bases his/her energy choice largely on price; alternatives need to be affordable</li> </ul>
3. The economy will adapt easily to a rapid, federally imposed energy transition.	<ul style="list-style-type: none"> <li>• Concerns about climate have placed the public sights squarely on combustion of fossil energy.</li> <li>• Economies are inextricably linked to energy; affordability and availability of energy are key to a healthy economy.</li> <li>• A healthy environment requires a healthy economy.</li> </ul>
4. Energy efficiency and savings alone will solve the problem.	<ul style="list-style-type: none"> <li>• Efficiency and energy savings are vital parts of the solution, but we cannot “save” our way out of a crisis.</li> <li>• Improved efficiency often increases demand for number of “units” (cars, refrigerators, microwaves, and computers).</li> <li>• Global industrialization, population growth, and modernization are increasing energy demand.</li> </ul>
5. There is abundant low-cost, conventional oil remaining to be discovered.	<ul style="list-style-type: none"> <li>• Much of the easy to produce (hard to find) conventional oil has been discovered and will plateau and then decline in production; i.e. conventional oil “peak” in the coming decades.</li> <li>• Much of the easy to find (hard to produce) unconventional oil will be developed in the next hundred years.</li> <li>• Biofuels require a tremendous amount of energy, water and soil.</li> <li>• Coal to liquids, gas to liquids, heavy oil and shale oil also require energy and water to produce.</li> </ul>
6. “Big Oil” controls the price of oil and gasoline and makes obscene profits.	<ul style="list-style-type: none"> <li>• Big Oil companies control less than 10 percent of global reserves. i.e., limited access to their primary product, and thus don’t control price.</li> <li>• Supply and demand are the major drivers of oil price, but price is also related to the value of the dollar, speculation, weather, government policy, and supply disruptions, among other things.</li> <li>• Lack of access is pushing Big Oil towards “unconventional” oil and natural gas.</li> <li>• Unconventional oil and natural gas are more expensive to develop (today).</li> <li>• Oil industry profits are volatile; it is an expensive and risky business.</li> </ul>
7. Cutting oil imports will stabilize and lower gasoline prices.	<ul style="list-style-type: none"> <li>• Oil is a fungible commodity; global demand is increasing and the price of oil is likely to remain high, but volatile.</li> <li>• Cutting U.S. oil imports will reduce U.S. supplies and drive gasoline price up.</li> <li>• Increased (carefully considered) access to U.S. resources would help reduce oil import demand as we transition to other fuels; it takes up to a decade to bring new production online.</li> <li>• Nationalization is popular in certain countries, but a poor idea overall. Global trade and access are vital for a healthy global economy.</li> </ul>
8. Global production of oil and natural gas are peaking and we are running out of fossil energy.	<ul style="list-style-type: none"> <li>• Fossil fuel resources (oil, natural gas and coal) can provide over 200 years at current consumption rates. Issues: emissions and long-term resource life.</li> <li>• Uranium and nuclear energy potential are vast. Issues: waste disposal and accident impact.</li> <li>• Dams, hydrothermal, wind, biomass, tides, and other emerging forms provide long-term regional supplements. Issues: cost, technology, and environment.</li> <li>• Solar energy is vast and electricity storage and transmission technologies should be pursued aggressively. Issues: technology and infrastructure.</li> </ul>
9. All coal is dirty.	<ul style="list-style-type: none"> <li>• Coal reserves are substantial.</li> <li>• Coal can be made reasonably clean with carbon sequestration</li> <li>• The power will cost more; a lot more initially.</li> <li>• There is a choice: store CO<sub>2</sub> in the atmosphere (today) or sequester it in subsurface brine reservoirs.</li> </ul>
10. The cost of energy is increasing.	<ul style="list-style-type: none"> <li>• The cost of electricity in the U.S. has been decreasing in real dollars; Clean power will cost more.</li> <li>• The cost of liquid fuels has decreased overall, until recently. Security of liquid supplies will cost more.</li> <li>• U.S. Energy use per GDP (energy intensity) continues to decline. Per capita use is relatively flat. □</li> </ul>

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# Geological Society of New Hampshire

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## 2009 SPRING DINNER MEETING

### *Topic:*

"THE MARCELLUS SHALE PLAY IN PENNSYLVANIA - NEW PARADIGMS FOR AN OLD RESOURCE"

Chris Laughrey, Senior Geologic Scientist, Pennsylvania Geological Survey

**Thursday, April 16th, 2009**

**Red Blazer Restaurant (NEW LOCATION!)  
72 Manchester Street, Concord, NH**

6:00 pm Social Hour, 7:00 pm Buffet Dinner, 7:45 pm Speakers

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**GSNH 2009 Spring Dinner Meeting, Thursday, April 16th, 2009**

Advance Reservations: \_\_\_\_\_ Member (Dues Paid) @ \$22.00.

- Member at the Door or Non-Member with Reservation (\$24.00).
- Non-Member without Reservation (\$26.00).
- Students \$10.00 with valid student ID card (Reservation Requested).

*Note: GSNH will also accept dinner reservations by e-mail, which will then allow you to pay at the door. Please note that e-mail reservations constitute an agreement with the Society for which you will be responsible to pay, whether you are able to attend or not, unless you cancel your reservation by noon the day before the Dinner.*

**Reservations will be taken until Monday, April 13, 2009!** Checks payable to GSNH.

**Mail to: Lee Wilder, 477 Putney Hill Road, Hopkinton, NH 03229.** Reply via e-mail to:  
[boslwne@tds.net](mailto:boslwne@tds.net)

Name(s): \_\_\_\_\_

Address: \_\_\_\_\_

Phone and/or Email: \_\_\_\_\_

Half the cost of the dinner may be tax-deductible as a business expense. **The lecture part of the program counts as 1.5 hours of CEU contact hour credit.**





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