



2018 UW-NPS Harlow Summer Seminars

AT THE AMK RANCH NEAR LEEK'S MARINA, NORTH OF COLTER BAY

Open to the public – reservations not required, \$5+ donation

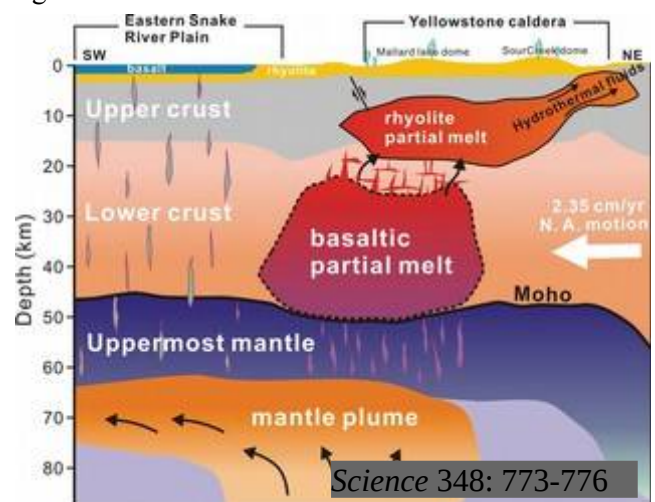
THURSDAY, JULY 12TH 2018, 5:30 PM

Anatomy of Old Faithful and Yellowstone; magma from earth's core to hot springs and geysers

Robert B. Smith

Distinguished Professor of Geophysics and Geology (Emeritus), University of Utah
Coordinating Scientist, Yellowstone Volcano Observatory

We have conducted detailed seismic studies of the plumbing anatomy of Old Faithful, the iconic geyser of Yellowstone, to determine its 3D structure and dynamic eruption properties. These studies reveal that Old Faithful is located at the edge of large hydrothermal reservoir composed of highly fractured rock, hot water and steam located west of the geyser and extending a km beneath the Old Faithful Lodge and other infrastructure. We found that Old Faithful eruptions do not have a notable seismic signal but large seismic signals of a precursor tremor every 95 minutes just prior to the eruption that we can now predict within seconds with the seismic signals. Moreover we show how Yellowstone's immense volcanic system is part of a giant mantle convection system originating at ~2700 km deep as a magmatic plume of partly molten rock rising in a conduit up to 70 km wide to underlie two shallow magma reservoirs beneath Yellowstone as shallow as 5 km at Old Faithful. Bob's group is now conducting detailed seismic studies of the world's tallest geyser, Steamboat, where I will show the initial results on monitoring this giant geyser. Overall these studies demonstrate the dynamics of the entire 400 km wide Yellowstone hotspot that has had a profound impact on the evolution of most of the western U.S. since Yellowstone volcanism began 800 km SW and 17 million years ago beneath SW Idaho.



Barbecue starts at 5:30 with hamburgers, veggie burgers, hot dogs, chips, salads and dessert for a \$5+ donation. The talk starts at 6:30 in the historic Berol Lodge at the AMK Ranch. Turn right when entering Leek's Marina parking lot in Grand Teton National Park.



uwnps@uwyo.edu

Biography (see attached photos):

Bob Smith has been a Professor at the University of Utah for 51 years leading a large group of scientists and students working on the dynamics of earthquakes and volcanoes and of the western American Plate. He has been working in Yellowstone for 61 years, beginning even before college, and has supervised 70 graduate student theses. Also he has conducted collaborative research as a Visiting Professor at the Swiss Federal Institute of Technology and at Cambridge University on the studying the evolution and structure of the Alps and served as the U.S. Exchange Scientist to the British Antarctic Survey. Bob co-founded the major U.S. collaborative research projects of IRIS, UNACO, chairing the Southern California Earthquake Center advisory comm., and was the principal founder of the extremely successful EarthScope Project. Also he has received numerous U.S. and European awards and medal, and continues his Yellowstone research where he makes discoveries every couple of years and treats Yellowstone-Teton as a living, breathing, shaking and baking natural laboratory.

Bobs book “Windows Into The Earth: The Geologic Story of Yellowstone and Grand Teton National Parks”, Oxford Univ. Press, has sold ~35,000 copies.

Contact information:

Bob Smith
Department of Geology and Geophysics
University of Utah
Room 243
115 South 1460 East
Salt Lake City, Utah 84112-0102
801-581-7129
robert.b.smith@utah.edu