Eart290H: Topics in Hydrogeology, Fall 2019
Geothermics Seminar

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Office hours:	Mon and Tue 1:30-2:30, A209

Course hours: Tue/Thu, 11:40-1:15 (feel free to bring a lunch!)
Course location: C332 (IGPP conference room)

Reading: Course reading will be made available digitally.
FYI, This text is available for digital checkout from the UCSC Library and provides some useful background:
Jaupart and Mareschal, 2011, Heat Generation and Transport in the Earth
https://ebookcentral-proquest-com.oca.ucsc.edu/lib/ucsc/detail.action?docID=647380

Assignments: We will read and discuss sections of books and papers, review ongoing research progress, and make presentations. Individuals will lead different parts of the discussion. Reading in advance and engagement and participation is expected at each meeting.

Grades/Evaluations:
Students are evaluated mainly on reading/discussing papers. Of course, you must also attend class. It will particularly important to prepare and make clear presentations when you are leading discussion. In most cases, it makes sense to take Eart290H S/U, but let's talk about this if you are not sure.

Course Goals:
- Learn about the science and history of geothermics
- Learn how thermal measurements have been used to understand global, regional, and local geological, geophysical, geochemical, and hydrogeologic conditions
- Learn about recent applications of thermal tools to elucidate processes related to hydrology, tectonics, climate change and other disciplines
- Develop ideas about how related tools and methods might be applicable to your research

Expectations:
- Everyone is expected to read the assigned materials in preparation for class, be ready to discuss, present on a variety of topics.
- People identified as leaders should think about key points, background that might be helpful, useful graphics, and other aids.
- Students will select a topic and pick 1-2 papers to present during final week of class.
- Please suggest alternative/additional papers and topics as the quarter progresses, so that this experience can be interesting and useful.

Class topic, assignment and reading list

(NB: Subject to revision as the quarter progresses. Please see course web site for links)

Date	**Topic**	**Leader**	**Reading(s)**
Thu 9/26	Course overview, age of Earth	Fisher	Thompson 1863, Stacy 2000, England 2007
Tue 10/1	Heat flow equations	Fisher	Turcotte 2002, Jaupart 2011
Thu 10/3	Lithosphere temperatures, heat flow	Fisher	Davies 2010, Furlong 2013
Tue 10/8	Heat flow methods	Fisher	Sass 2011, Morgan 2011, Davis 2019
Thu 10/10	Thermal conductivity	Fisher	Von Herzen 1959, Beardsmore 2001
Tue 10/15	Heat flow and groundwater	Fisher	Bredehoeft 1967, Sleep 1978
Thu 10/17	Heat flow and groundwater	Fisher	Kurylyk, 2019a, Kurylyk, 2019b
Tue 10/22	Borehole temperature and climate change	TBD	Davis 2011, Lachenbruch 1986
Thu 10/24	Borehole temperature and climate change	TBD	Harris 2005b, Harris 2005b
Tue 10/29	Streambed seepage	Fisher	Stallman 1965, Constantz 1998
Thu 10/31	Streambed seepage	TBD	Hatch 2010, +another?
Tue 11/5	Distributed temperature sensing	TBD	Selker 2006, Bense 2016
Thu 11/7	Distributed temperature sensing	TBD	Briggs 2012, +another?
Tue 11/12	AF away	**No class meeting**	
Thu 11/14	AF away	**No class meeting**	
Tue 11/19	San Andreas Fault - HF	TBD	Lachenbruch 1980, Sass 1997
Thu 11/21	San Andreas Fault - HF	TBD	Saffer 2003, Fulton 2004
Tue 11/26	Serpentinization?	TBD	we have some options…
Thu 11/28	**Thanksgiving**	**No class meeting**	
Tue 12/3	Present papers	Students TBD	TBD
Thu 12/5	Present papers	Students TBD	TBD