CALIFORNIA INSTITUTE OF TECHNOLOGY

Division of Engineering and Applied Science
Division of Geology and Planetary Sciences
Pasadena, California 91125

NSF I/UCRC for
Geomechanics and Mitigation of Geohazards (GMG)

Fall Meeting (December 3-5, 2019)

- **Agenda -**

December 3, 2019

Deep Dive: *Monitoring and forecasting induced seismicity: promise and limitations of Machine Learning*

Location: Sharp Auditorium (155 Arms)

8:30 – 9:00 am	Registration, Breakfast, and Networking Time
9:00 - 9:10 am	NSF Introduction (Barbara Ransom)
9:10 – 10:00 am	Introduction to Machine Learning algorithms for earthquake detection and locations (Ross)
10:00 - 10:30 am	BREAK- Technical Forum and Social with Poster Session
10:30 – 12:30 am	Report and discussion of application of ML to detect and locate induced earthquakes (Jonathan Smith, Bing Li,)
12:30 - 2:00 pm	LUNCH- Technical Forum and Social with Poster Session
2:00 – 4:00 pm	Assessing the effect of fluid injection on seismicity through stress modeling (KJ Im, Elias Heimisson, Jonathan Smith, Jean-Philippe Avouac)
4:00 - 5:00 pm	Break-out discussions at coffee tables
5:00 - 6:30 pm	Debriefing
7:00 - 8:30 pm	DINNER- (all participants invited)

Location: Sharp Auditorium (155 Arms)

8:00 - 8:30 am	Registration, Breakfast, and Networking Time
8:30 - 8:45 am	Welcome Remarks (center Directors)
8:45 - 9:00 am	NSF presentation and LIFE forms (Barbara Ransom/Pete He)

9:00 - 10:20 am   Project Presentations, progress and updated plans (PIs)
- GMG-5.2: Hydraulic Fracturing: Modeling and Optimization (Ortiz/Pandolfi)
- GMG-4.2: Understanding conditions for stable/unstable fault slip induced by fluid injections (Lapusta)
- GMG-6.2: Experimental investigation of the interactions between fluids and failure of rock faults in shear (Rosakis)
- GMG-1.2: Ground Failure and Infrastructure (Asimaki)

10:20 - 11:00 am   BREAK- Technical Forum and Social with Poster Session

11:00 - 12:00 am   Project Presentations, progress and updated plans (PIs)
- GMG-8.2: Seismological Monitoring with Machine Learning (Ross)
- GMG-9.2: Application of DAS in monitoring microseismicity and subsurface structure changes (Zhan)
- GMG-2.2 : Modeling Deformation and Seismicity due to fluid injections (Avouac)

12:00 - 2:00 pm   LUNCH- Technical Forum and Social with Poster Session

2:00 - 3:00 pm   Presentations by IAB members and Presentation of New Projects

- Microseismic Monitoring and Interpretation: Beyond Hydraulic Fracture Geometry (Jing Du)
- GMG-10.1:Seismic ray tracing with deep neural networks (Ross)

3:00 - 4:30 pm   Break-out discussions at coffee tables

4:30 - 5:45 pm   Debriefing of break-out discussions and LIFE form Review (all participants)

5:45 – 6:00 pm   Closing Remarks

6:30 - 8:30 pm   Dinner (all participants)

December 5, 2019

Location: Buwalda (151 Arms)

8:00 - 8:30 am	Breakfast
8:30 - 8:45 pm	Road map (GMG directors)
8:45 - 9:45 pm	IAB Organizational meeting, formative discussion (IAB Member, NSF)
9:45 - 10:00 am	BREAK
10:00 - 11:00 pm	IAB meeting (IAB Members, NSF and center Directors): ByLaws
11:00 - 11:30 pm	Summary report, Action items and closing remarks (all participants)
11:30 - 2:00 pm	LUNCH

Break-out discussions (All participants)

- One PI and one person from IAB in charge of reporting will stay at the same table. All others can rotate from one table to the other during the discussion.

IAB Organizational Meeting and Formative Discussion (IAB Members and NSF only):

- Discussion of impressions of previous day presentations and LIFE forms
- Formulation of recommendation/feedback to center leadership.

IAB Meeting (IAB Members, NSF and center Directors)**:**
- Discussion of Bylaws and approval
- Report to the center directors

Experimental investigation of the interactions between fluids and failure of rock faults in shear