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The Center is home to a corps of Center Postdoctoral Fellows, chosen from nominations made by senior theoretical scientists around the world. A group of senior Faculty Fellows, chosen from science and engineering departments across the campus, are responsible for guiding the Center. Center activities include focused topical programs chosen from proposals by Princeton faculty across the natural sciences. The Center is located on the fourth floor of Jadwin Hall, in the heart of the campus “science neighborhood”. The Center hopes to become the focus for innovation and cross-fertilization in theoretical natural science at Princeton.

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To find out more about Center Postdoctoral Fellowships and Programs see: https://pcts.princeton.edu

Fracture across fields: insights from materials science, biology, and geophysics

May 8-10, 2024
Room 407, Jadwin Hall

Organizers
John Kolinski
Andrej Košmrlj
Ching-Yao Lai
Reza Moini
Abigail Plummer

This workshop is supported in part by CEE, PCCM, PMI, SEAS, MAE, Physics
**Fracture across fields**

**Wednesday, May 8, 2024**

8:00-9:00  Check in and Light Breakfast
9:00-9:10:  Opening remarks

9:10-09:50  **K. Ravi-Chandar**  
Fracture in soft materials

9:50-10:30  **Zdeněk Bažant**  
Reformulation of fracture mechanics from nano to macro in consequence of the gap test

10:30-11:00:  Coffee break

11:00-11:40:  **Markus Buehler**  
Physics-aware generative artificial intelligence to predict fracture dynamics and solve inverse problems

11:40-12:20:  **Somdatta Goswami**  
Deep operator learning for fracture analysis.

12:20-2:00:  Lunch Break

2:00-2:40  **Luka Pocivavsek (Zoom)**  
Aortic Morphogenesis: Tracking Shape Evolution from Normal Growth to Pathology

2:40-3:20  **Kristin Myers**  
Soft Tissue Mechanics in Pregnancy

3:20-3:50  Coffee break

3:50-4:30  **Nadia Lapusta (Zoom)**  
Fracture mechanics in earthquake source processes

4:30-5:10  **Alice Gabriel**  
Fault-size dependent fracture energy explains rupture dynamics of cascading earthquakes in multiscale fracture networks

5:10 – 7:00  Poster Session and Reception for everyone at PCTS

**Thursday, May 9, 2024**

8:30-9:00  Light Breakfast

9:00-9:40:  **Vikram Deshpande**  
Some interesting fracture phenomena: from architected solids to solid state-batteries.

9:40-10:20:  **Tal Cohen**  
Exploring fracture morphologies in soft solids: theory and experiments

10:20-10:50:  Coffee break

10:50-11:30:  **Guillaume Charras**  
Rupture strength of living cell sheets

11:30-12:10:  **Moumita Das**  
Robustness and fracture-resistance of composite biopolymer networks in cells and tissues

12:10-1:20:  Lunch Break

1:20-2:00  **Gianluca Cusatis**  
Discrete Modeling of Fracture in Quasi-Brittle Infrastructure Materials

2:00-2:40  **Mokhtar Adda-Bedia**  
Nonlinear elastic fracture Mechanics

2:40-3:20  **Irmgard Bischofberger**  
Crack morphology in drying colloidal suspension drops

3:20-4:00  Coffee break

4:00-5:00  **Camilla Cattania**  
Physics Colloquium at PCTS  
Fracture Mechanics insight into earthquake behavior
Fracture across fields  
**Friday, May 10, 2024**

8:30-9:00  Light Breakfast

9:00-9:40:  **Brian Camley**  
Dissociation of clumps of cells in collective cancer invasion

9:40-10:20:  **Vivek Prakash**  
Motility induced fractures in a simple marine animal’s epithelia

10:20-10:50:  **Coffee break**

10:50-11:30:  **Will Steinhardt**  
The Rules of Fracture Roughness and Fully Confined Rubber Earthquakes: How Heterogeneity Drives Observable Behaviors and How We Can Study It

11:30-12:10:  **Lucas Zoet**  
The role of fractures in shaping glacial landscapes

12:10  Lunch and Departure