Matěj Peč

CURRICULUM VITAE

TELEPHONE: (001) 612 598 5088 **E-MAIL:** mpec@mit.edu **WEB:** http://mpec.scripts.mit.edu/peclab/

EDUCATION

2008 – 2012 **Ph.D.** in Rock Mechanics at University of Basel, Basel, Switzerland.

Thesis Experimental Investigation on the Rheology of Fault Rocks
(advisors: Prof. R. Heilbronner, Prof. H. Stünitz)
graduated *"**summa cum laude**"*

2007 – 2008 **M.Sc.** in Structural Geology at Charles University, Prague, Czech Republic.

Thesis Tectono-metamorphic Evolution of the Aulus Basin Metasediments in the Vicinity of the Lherz Peridotite Massif, North Pyrenean Metamorphic Zone
(advisor: Dr. S. Ulrich)

2006 – 2007 **M.Sc.** at Université Montpellier 2, Montpellier, France.

M1 stage Microstructural Study of the Calcareous Rocks in the Aulus Basin South of Lherz
(advisors: Dr. S. Ulrich, Dr. Y. Lagabrielle)

2003 – 2006 **Bc.** in Geology at Charles University, Prague, Czech Republic.

Thesis Geology and Metamorphism of the Mesozoic in the North Pyrenean Zone in Vicinity of Lherz
(advisors: Dr. S. Ulrich)

APPOINTMENTS

2017 – NOW **Assistant Professor** at Massachusetts Institute of Technology, EAPS, Cambridge, U.S.A

2012 – 2017 **Post-doctoral researcher** at University of Minnesota, Minneapolis, MN, U.S.A

- "Reactive melt migration in mantle rocks" (collaborators: Prof. D. Kohlstedt, Prof. B. Holtzman, Dr. M. Zimmerman)

2008 – 2012 **Visiting scientist** at University of Tromsø, Tromsø, Norway

- performing rock deformation experiments in a solid medium deformation apparatus
  (14 months in total)

2008 – 2012 **Teaching assistant** at University of Basel, Basel, Switzerland

- Structural Geology
- System Earth (introductory geology course)
- Sedimentology
- Image analysis in Geosciences
- Texture analysis and orientation imagining
- Field assistant in Structural geology, Neotectonics and Sedimentology excursions

2009 **Visiting scientist** at Texas A & M, College station, TX, U.S.A.

- performing rock deformation experiments in a gas medium deformation apparatus (2 weeks)

PEER-REVIEWED ARTICLES

*[#] indicates mentored post-doc / technical associate, *indicates mentored PhD student, [$] indicates visiting professor*

27. Bernabé, Y. **Peč, M.**, (submitted to *JGR*)
Brittle damage processes around equi-dimensional pores or cavities in rocks: implications for the brittle-ductile transition

26. Ott, J., Condit, C., Bernard, R., Schulte-Pelkum, V., **Pec, M.** (accepted in *JGR*)
Seismic Anisotropy of Mafic Blueschists: constraints from the exhumed rock record

25. Bai, T., [#]Xing, T., **Peč, M.**, Nakata, N. (in revision in *GJI*)
High-resolution source imaging and moment tensor estimation of acoustic emissions during brittle creep

24. Triaud, A., de Wit, J., Klein, F., Turbet, M., Rackham, B., Niraula, P., Glidden, A., Jagoutz, O., **Peč, M.,** Petkowski, J., Seager, S., Selsis, F., **(2023)**
Atmospheric carbon depletion as a tracer of water and biomass on temperate terrestrial exoplanets. *Nature Astronomy* 8, 17–29. https://doi.org/10.1038/s41550-023-02157-9

23. *Seltzer, C, **Peč, M.,** Zimmerman, M., Kohlstedt, D., **(2023)**
Melt network reorientation and crystallographic preferred orientation development in sheared partially molten rocks.
Geochemistry, Geophysics, Geosystems. 24(9), e2023GC010927.

22. [#]Ghaffari, H., **Peč, M.,** [#]Mittal, T., [#]Mok, U., *Chang, H., Evans, B. **(2023)**
Microscopic Defect Dynamics of a Brittle-to-Ductile Transition.
Proceedings of the National Academy of Sciences, doi: 10.1073/pnas.2305667120

21. *Ortega-Arroyo, D. **Peč, M., (2023)**
A Closer Look into Slickenslides: Deformation on and under fault surfaces
Journal of Structural Geology, https://doi.org/10.1016/j.jsg.2023.104860

20. [$]Boneh, Y., **Pec, M.,** Hirth, G., **(2023)**
High-pressure mechanical properties of talc - Implications for fault strength and slip processes
Journal of Geophysical Research-Solid Earth, https://doi.org/10.1029/2022JB025815

19. *Hoyos, S., Florez, D., **Pec, M.,** Huber, C. **(2022)**
Crystal shape control on the repacking and jamming of crystal-rich mushes
Geophysical Research Letters, https://doi.org/10.1029/2022GL100040

18. Bernabé, Y., **Pec, M.**, **(2022)**
Brittle creep and brittle failure of rocks: a reformulation of the wing crack model
Journal of Geophysical Research-Solid Earth, 127, e2022JB024610. https://doi.org/10.1029/2022JB024610

17. [#]Xing, T., [#]Ghaffari, H., [#]Mok, U., **Pec, M.**, **(2022)**
Creep of CarbFix Basalts: Influence of rock - fluid interaction
Solid Earth, 13, 137–160, https://doi.org/10.5194/se-13-137-2022, 2022

16. *Sun, H., **Pec, M., (2021)**
Nanometric flow and earthquake instability
Nature Communications 12, 6779. https://doi.org/10.1038/s41467-021-26996-0

15. Ranganathan, M., Michew, B., Meyer, C., **Peč, M.**, **(2021)**
Recrystallization of ice enhances the vulnerability of ice shelves to fracture.
Earth and Planetary Science Letters 576, 117219; doi: 10.1016/j.epsl.2021.117219

14. [#]Ghaffari, H., [#]Mok, U, **Pec, M., (2021)**
On Calibration of Piezoelectric Sensors with Laser Doppler Vibrometer.
Journal of the Acoustical Society of America, 150, 2503; doi: 10.1121/10.0006445

13. **Pec, M.,** *Al Nasser, S., **(2021)**
Formation of nanocrystalline and amorphous materials causes parallel brittle-viscous flow of crustal rocks: experiments on quartz - feldspar aggregates.
Journal of Geophysical Research-Solid Earth, 126, e2020JB021262. https://doi.org/10.1029/2020JB021262

12. #Ghaffari, H., **Pec, M., (2020)**
An ultrasound probe array for high-pressure, high-temperature solid medium deformation apparatus.
Review of Scientific Instruments. https://doi.org/10.1063/5.0004035

11. **Pec, M.,** Holtzman, B., Zimmerman M., Kohlstedt D., **(2020)**
Influence of Lithology on Reactive Melt Flow Channelization: Infiltration Instabilities and Dikes.
Geochemistry, Geophysics, Geosystems. https://doi.org/10.1029/2020GC008937

10. Quintanilla-Terminel, A., Dillman, A., **Pec, M.**, Dietrich, G., Kohlstedt D., **(2019)**
Radial melt segregation during extrusion of partially molten rocks.
Geochemistry, Geophysics, Geosystems, doi doi.org/10.1029/2018GC008168

9. #Ghaffari, H.O., Griffith, W.A, **Pec, M., (2019)**
Solitonic State in Microscopic Dynamic Failures.
Scientific Reports, *doi: 10.1038/s41598-018-38037-w*

8. Reber, J., **Pec, M., (2018)**
Comparison of brittle- and viscous creep in quartzites: Implications for semi-brittle flow.
Journal of Structural Geology, doi:10.1016/j.jsg.2018.05.022

7. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., **(2017)**
Reaction infiltration instabilities in mantle rocks: an experimental investigation.
Journal of Petrology, 58/5, 979-1003.

6. **Pec, M.,** Stünitz, H., Heilbronner, R., Drury, M., (**2016**)
Semi-brittle flow of a granitoid fault rocks in experiments.
Journal of Geophysical Research: Solid Earth, 121, 1677-1705, doi: 10.1002/2015JB012513

5. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., **(2015)**
Reaction infiltration instabilities in experiments on partially molten rocks.
Geology, vol. 43, no. 7, 575-578, doi: 10.1130/G36611.1

4. **Pec, M.,** Stünitz, H., Heilbronner, R., Drury, M., De Capitani, C. **(2012)**

Origin of pseudotachylites in slow creep experiments.
Earth and Planetary Science Letters, 355-356, 299-310.

3. **Pec, M.,** Stünitz, H., Heilbronner, R. **(2012)**

Semi-brittle deformation of granitoid gouges in shear experiments at elevated pressures and temperatures.

Journal of Structural Geology, *38, 200-221* ***(JSG Student Paper of the Year).***

2. Boutareaud, S., Hirose, T., Andréani, M., **Pec, M.,** Calugaru, D-G., Boullier, A-M., Doan, M-L. **(2012)**

On the role of phyllosilicates on fault lubrication: Insight from micro- and nanostructural investigations on talc friction experiments.
Journal of Geophysical Research, 117, B08408.

1. Tarantola, A., Diamond, L.W., Stünitz, H., Thust, A., **Pec, M**., **(2012)**

Modification of fluid inclusions in quartz by deviatoric stress. III: influence of principal stresses on inclusion density and orientation.
Contributions to Mineralogy and Petrology, 164, 537-550.

BOOK CHAPTERS

1. Daines, M., **Pec, M. (2015)**
Migration of melt.

Encyclopedia of Volcanoes, 2nd Edition.
Editor-in-chief: H. Sigurdsson

PATENTS

1. Ghaffari, H., **Pec, M. (2022)**
   High-temperature miniature ultrasonic probes
   Provisional patent submitted Nov. 2022

ACADEMIC SERVICE

MIT-WHOI Joint Program Marine Geology & Geophysics committee member

Crosby post-doc committee 2023

Freshman advisor 2017-2019.

Generals committee member:

Benjamin Urann, *JP MIT-WHOI* (2017), Ekaterina Bolotskaya, *MIT-EAPS* (2018), Saleh Al Naser, *MIT-EAPS*, (2018) Hongyu Sun, *MIT-EAPS* (2019), Lubna Al Baghrouty, *MIT-EAPS*, 2019, Cassandra Seltzer, *MIT-EAPS* (2020), Ignacio Garcia, *MIT-CEE* (2020), Eli Mansbach, MIT EAPS, (2021), Susana Hoyos, MIT EAPS (2021), Hilary Chang MIT EAPS, (2021), Daniel Ortega-Arroyo, MIT-EAPS, (2021), Mariona Badenas Agusti, MIT EAPS, (2021), Majed Almubarak, MIT CEE (2022), Justin Linick, MIT EAPS (2022), Mila Lubeck, MIT EAPS (2023).

Generals committee chair:

Eric Beauce, *MIT-EAPS* (2018), Prajwal Niraula, *MIT-EAPS* (2020 / 2021)

PhD Thesis committee member:

Yuval Tal, *MIT-EAPS* (2017), Benjamin Urann *(JP MIT-WHOI)*, Jinhua Gong *(JP MIT-WHOI),* Josimar Alves da Silva *(MIT-EAPS),* Karine Ip Kiun Chong (2019, *MIT-MechE*), Ekaterina Bolotskaya, *MIT-EAPS,* Meghana Ranganathan (*MIT-EAPS*), Patrick Beaudry (*MIT-EAPS*), Mariona Badenas Augusti (MIT-EAPS), Ayako Tsuchiyama (*MIT-EAPS*),

PhD Thesis committee chair:

Saied Mighani, MIT-EAPS (2019), William Shivenar (MIT-EAPS, 2021), Hongyu Sun (MIT-EAPS 2022), Paris Smalls (MIT-WHOI JP 2023)

MSc committee member:

Eric Beauce (2018), Megan Guenther (2022)

AWARDS AND SCHOLARSHIPS

2022 - 2024	Elected Chair of "Physical Properties of Earth Materials" of AGU
2019 - 2022	Victor P. Starr Career Development Chair
2012	Journal of Structural Geology: Student Author of the Year Award
2011	Staszek Brud award – best students oral presentation, Central European Tectonics Group
2006 – 2007	ERASMUS scholarship (2 semesters)

TEACHING

12.S591: Image Analysis in Geosciences	IAP 2018
12.S489: Dynamics of Melt Migration	Spring 2018
12.113: Structural Geology	Fall 2018/21
12.S597: Special Seminar in Earth, Atmospheric and Planetary Sciences	Fall 2018/2019
12.524: Mechanical Properties of Rocks	Spring 2019
12.202/502: Deformation, Flow and Fracture in Earth and Terrestrial Planets	Fall 2019/21
12.203/503: Mechanics of Earth	Spring 2020/2022

12.DTEx: Deform the Earth! (MITx residential course) Spring 2020

12.091: Current Topics: The Grand Challenge: Making Geological Carbon Sequestration Applicable Spring 2021

12.S593: Geoengineering of carbon sequestration Spring 2023

MENTORING

PhD, 2nd generals students – Emilie Bowman, Saleh Al Nasser, Hongyu Sun, Lubna Al Baghrouty, Elias Mansbach, Hilary Chang, Susana Hoyos, Jae Deok Kim,

PhD students – Cassandra Seltzer, Daniel Ortega-Arroyo, Maia Cohen

Post-docs – Hamed O. Ghaffari, Amy Moser, Jonathan Simpson

Technical Associate II: Ulrich Mok

Undergraduate: Anna Roganz (NSF REU), Francesca Riley (NSF REU), Sarah Wells-Moran (Wellesley College), Titus Tsai (MIT)

PAST GROUP MEMBERS: Cailey Condit (assistant prof. at University of Washington), Tiange Xing (researcher at Chinese Offshore Petroleum Company)

PROFESSIONAL MEMBERSHIPS & SERVICE

American Geophysical Union

European Geoscience Union

Physical Properties of Earth Materials

Reviewer for *NSF,* ACS, *Computer and Geosciences, Journal of Metamorphic Petrology, Geophysical Research Letters, Nature Publishing Group, Science Advances, Geology, Journal of Geophysical Research, Earth and Planetary Science Letters, Journal of Structural Geology, Tectonophysics, Journal of Applied Physics* and *Contributions to Mineralogy and Petrology*

Discussion leader, *Gordon Research Seminars*, Andover, NH, 2014

NSF panel member (2019, 2020)

Convener, *Fault rocks in the lab and in the field: microstructural constraints on fault strength and sliding stability,* EGU 2015, EGU 2016.

Convener, *Deformation in the Middle and Lower Crust: Integrating Geologic Observations, Experiments, and Theory to Constrain Crustal Rheology*, AGU 2019

Convener, *Effects of heterogeneities on the strength of the crust and mantle*, AGU 2020, 2021, 2022

Convener, *Physical Properties of Earth Materials.* AGU 2021, 2022, 2023

INVITED TALKS

JUN. 2023 Cooperative Institute for Dynamic Earth Research (CIDER) workshop, Berkeley, CA
"Experimentalist's take on stress-driven & reaction driven melt migration

MAY 2023 Computational Infrastructure for Geodynamics (CIG) webinar
"What Does a Brittle – to – Ductile Transition Sound Like?"

MAR 2023 University of Southern California, Departmental Colloquium, Los Angeles, CA
"What Does a Brittle – to – Ductile Transition Sound Like?"

JAN 2023 University of Oslo, Njord seminar series, Norway
"Nanometric flow and earthquake instability"

NOV 2022 Brown University, DEEPS Colloquium, Providence, RI
"What Does a Brittle – to – Ductile Transition Sound Like?"

AUG 2022 Martin-Luther Universität Halle, Geodynamics seminar, Halle, Germany

	"The Brittle – Ductile Transitions"
AUG 2022	Gordon Research Conference: Rock Deformation, Lewiston, ME
	"The Brittle – Ductile Transitions"
JUN. 2022	Tohoku University, Sendai, Japan
	"Nanometric flow and earthquake instability"
APR. 2022	Texas A&M Geophysics seminar, College Station, TX
	"Nanometric flow and earthquake instability"
OCT. 2021	Scripps Institute of Oceanography, IGPP seminar, CA
	"Reactive Melt Migration in Partially Molten Rocks in Experiments"
OCT. 2021	The City College of New York, Earth & Environmental Science Seminar, New York, NY
	"Earthquake nucleation at the base of the seismogenic layer"
SEP. 2021	MIT-EAPS Departmental Lecture Series, MA
	"Earthquake nucleation at the base of the seismogenic layer"
JUN. 2021	ERL Annual Founders meeting plenary talk, MA
	"In-situ Carbon Mineralization"
MAY. 2021	Earth and Space Sciences Department Colloquium, University of Washington, Seattle, WA, USA
	"Earthquake nucleation at the base of the seismogenic layer"
SEP. 2019	Earth, Environmental and Planetary Sciences, Rice University, Houston, TX, USA
	"Rheological properties of nanocrystalline and amorphous fault rocks"
JUN. 2019	Earthquake Research Institute, University of Tokyo, Tokyo, Japan
	"**Reactive Melt Migration in Partially Molten Rocks: Insights from Experiments"**
APR. 2018	Lamont-Doherty Earth Observatory, Columbia University, New York, NY, USA
	"**An Experimental Study of Reactive Melt Migration"**
MAR. 2018	Brown University, Providence, RI, USA
	"**Reaction Infiltration Instabilities in Partially Molten Rocks: Effect of Lithology & Melt Fraction"**
FEB. 2018	University of Pennsylvania, Philadelphia, PA, USA
	"**Reaction Infiltration Instabilities in Partially Molten Rocks"**
JAN. 2018	Woods Hole Oceanographic Institute, Woods Hole, MA, USA
	"**Reaction Infiltration Instabilities in Partially Molten Rocks"**
DEC. 2018	AGU fall meeting, Washington D.C.
	"Deformation Mechanisms at the Base of the Seismogenic Layer"
AUG. 2018	Gordon Research Conference – Rock Deformation, Andover, NH, USA
	"**Semi-brittle Flow of the Continental Crust"**
NOV. 2017	Harvard University, Cambridge, MA, USA
	"Experimental Evidence of Reactive Melt Channelization in Partially Molten Mantle Rocks"
NOV. 2017	MIT – Dept. of Civil and Environmental Engineering, Cambridge, USA
	"Semi-brittle Flow of Granitoid Fault Rocks in Experiments"
OCT. 2017	Geological Society of America Annual Meeting, Seattle, WA, USA
	"Strain Partitioning and Localization in Granitoid Fault Rocks Deformed at Elevated Pressures and Temperatures"

AUG. 2017	Goldschmidt, Paris, France
	"Experimental Insights on the Reactive Melt Migration in the Upper Mantle"
FEB. 2016	Iowa State University, Ames, IA, USA
	"Semi-brittle Flow of Granitoid Fault Rocks"
FEB. 2016	University of Colorado, Boulder, CO, USA
	"Reactive Melt Channelization in Experiments on Partially Molten Rocks"
FEB. 2016	University of Colorado, Boulder, CO, USA
	"Semi-brittle Flow of Granitoid Fault Rocks in Experiments"
NOV. 2015	University of Wisconsin, Madison, WI, USA
	"Reaction Infiltration Instabilities in Experiments on Partially Molten Rocks"
MAY 2015	Massachusetts Institute of Technology - EAPS, Cambridge, MA, U.S.A
	"Reaction Infiltration Instabilities in Experiments on Partially Molten Rocks"
MAY 2015	Lamont-Doherty Earth Observatory, Columbia University, NY, U.S.A
	"Reaction Infiltration Instabilities in Experiments on Partially Molten Rocks"
DEC. 2013	AGU fall meeting, San Francisco, CA, U.S.A
	"Fault-related amorphous materials and their influence on the rheological behavior of fault zones"
FEB. 2013	University of Minnesota, Minneapolis, MN, U.S.A
	"Semi-brittle Flow of Fault Rocks: On the Origin of Pseudotachylites in Slow Creep Experiments"
OCT. 2012	Charles University, Prague, Czech Republic
	"Rheology of fault rocks in semi-brittle flow regime"
OCT. 2012	University of Strathclyde, Glasgow, U.K.
	"Semi-brittle Flow of Fault Rocks: On the Origin of Pseudotachylites in Slow Creep Experiments"
JUL. 2012	Utrecht University, Utrecht, The Netherlands
	"Behaviour of Granitoid Fault Rocks in Semi-brittle Flow: Origin of Pseudotachylites in Slow Creep Experiments"
APR. 2012	Ruhr-University Bochum, Bochum, Germany
	"Origin of Pseudotachylites in Slow Creep Experiments"
MAR. 2012	ETH Zürich, Zürich, Switzerland
	"Origin of Pseudotachylites in Slow Creep Experiments"
NOV. 2011	PGP Oslo, Oslo, Norway
	"Slow Pseudotachylites"
APR. 2010	Geophysical Institute, Czech Academy of Sciences, Prague, Czech Republic
	"Transition from frictional to viscous deformation in granitoid fault rocks"
FEB. 2010	University of Tromsø, Tromsø, Norway
	"Semi-brittle Flow in Granitoid Fault Rocks"
DEC. 2009	ETH Zürich, Zürich, Switzerland
	"Transition from frictional to viscous deformation in granitoid fault gouges"

CONFERENCE ABSTRACTS

*[#] indicates mentored post-doc / research scientist / technical staff, *indicates mentored PhD student*

AGU2023 abstracts not included yet.

1. Boneh, Y., Ohl, M., Plümper, O., Hirth, G., & **Peč, M.** (2023). The Weakest Link–Revealing the microphysical deformation mechanisms of talc under PT conditions associated with fault creep and slow slip events (No. EGU23-11449). Copernicus Meetings.

2. *Seltzer, C., Peč, M., Zimmerman, M., & Kohlstedt, D. (2023). Co-evolution of melt and crystal phases in experimentally sheared partially molten rocks and generation of seismic anisotropy during rapid deformation (No. EGU23-539). Copernicus Meetings.

3. *Hoyos, S., *Kim, J. D., #Ghaffari, H. O., **Pec, M.,** Florez, D., & Huber, C. (2022, December). Using Ultrasound Probes to study magma mush compaction: Effects of particle shape and particle interactions in an analog system. In *Fall Meeting 2022*. AGU.

4. **Pec, M.,** Tikoff, B., Kronenberg, A. K., Williams, R. T., Newman, J., Mok, U., & Phillips, N. J. (2022, December). Cyberinfrastructure Tools for Microscopy and Experimental Rock Deformation Data. In *Fall Meeting 2022*. AGU.

5. Bai, T., #Xing, T., **Pec, M.,** & Nakata, N. (2022, December). Characterization of Acoustic Emissions during Transient Creep Deformation due to Brittle Creep using Geometric-Mean Reverse-Time Migration. In *Fall Meeting 2022*. AGU.

6. **Pec, M.,** #Ghaffari, H. O., Mittal, T., #Mok, U., *Chang, H., & Evans, J. B. (2022, December). Microscopic Defect Dynamics of a Brittle-to-Ductile transition. In *Fall Meeting 2022*. AGU.

7. Bonanno, A., Ott, J. N., Condit, C. B., & Pec, M. (2022, December). The seismic anisotropy of glaucophane aggregates experimentally deformed at subduction zone pressure and temperature conditions. In *Fall Meeting 2022*. AGU.

8. Ott, J. N., Condit, C. B., Pec, M., & Bonanno, A. (2022, December). Experimental Constraints on the Strength and Deformation Mechanisms of Glaucophane at Subduction Zone Conditions. In *Fall Meeting 2022*. AGU.

9. #Xing, T., #Ghaffari, H., & Pec, M. (2022, December). Characterizing Transient Brittle Creep by Ultrasonic Pulsing. In *Fall Meeting 2022*. AGU.

10. *Ortega-Arroyo, D., Fu, R. R., **Pec, M.,** #Ghaffari, H., & Volk, M. (2022, December). Deformation on the Microscale: Quantifying Source Parameters and Localized Heating during High-pressure Failure in the Laboratory. In *Fall Meeting 2022*. AGU.

11. Qiu, H., Nakata, N., **Pec, M.,** Sánchez-Pastor, P., Obermann, A., (2021) Ambient noise-based monitoring of seismic wave velocity modultations at the CarbFix reinjection site, SW Iceland. *SEGl meeting*

12. #Xing, T., *Mansbach, E., #Ghaffari, H., #Mok, U., **Pec, M.,** (2021) Creep of Basaltic Rocks Undergoing Carbonation. *AGU fall meeting*

13. Holtzman, B., Groebner, N., Sawi, T., #Xing, T., **Pec, M**., #Ghaffari, H., #Mok, U., Skarbek, R., Paisley, J., Mittal, T., Waldhauser, F., Beauce, E., Barth, A., (2021) Unsupervised feature extraction applied to acoustic emissions during brittle creep of basalt under dry and wet conditions. *AGU fall meeting*

14. Qiu, H., Nakata, N., **Pec, M.,** Sánchez-Pastor, P., Obermann, A., (2021) Ambient noise-based monitoring of seismic wave velocity modultations at the CarbFix reinjection site, SW Iceland. *AGU fall meeting*

15. Fu, R., **Pec, M.,** Volk, M., *Ortega-Arroyo, D (2021) Quantifying localized heating and grain rotation in fault zones using high-resolution magnetic field imaging. *AGU fall meeting*

16. *Ortega-Arroyo, D., **Pec, M.** (2021) A closer look into slickenlines: deformation on and under the surface. *AGU fall meeting*.

17. *Chang, H., #Ghaffari, H., #Mok, U., Evans, B., **Pec, M.,** (2021) Acoustic constraints on semi-brittle deformation of Carrara marble. *AGU fall meeting*

18. *Hoyos, S., **Pec, M.,** Huber, C., Flores, D., (2021) An experimental study on magma-mush compaction. *AGU fall meeting*

19. Ranganathan, M., Minchew, B., Meyer, C., Pec, M. (2021) An energetics perspective of ice deformation. *AGU fall meeting*

20. **Pec, M.,** Al Nasser, S.* (2021) Formation of amorphous materials causes parallel brittle-viscous flow in crustal rocks. *EGU virtual meeting.*

21. Ranganathan, M., Minchew, B., Meyer, C., **Pec, M.** (2021) Recrystallization of ice enhances the creep and vulnerability to fracture of ice. *EGU virtual meeting.*

22. Ranganathan, M., Minchew, B., Meyer, C., **Pec, M.** (2020) Dynamic recrystallization and energy balance within glacier shear margins. *AGU virtual fall meeting.*

23. #Xing, T., #Ghaffari, H., *Al Bagrouthy, #Mok, U., **Pec M.** (2020) Multi-physics characterization of time-dependent brittle deformation in basalt undergoing carbonation. *AGU virtual fall meeting.*

24. *Seltzer C., **Pec, M,** Kohlstedt, D., Zimmerman, M., Holtzman, B., (2020). A closer look at melt network geometry in deformation experiments: Implications for seismic anisotropy. *AGU virtual fall meeting.*

25. *Ortega-Arroyo, D., **Pec, M.** (2020) A closer look into Slickenlines: The link between surface roughness and microstructure. *AGU virtual fall meeting*.

26. #Condit, C., **Pec, M.,** Mahan, K., Chin, E., Mitroi, T., *Seltzer, C., (2020) Integrating experimental and geologic observations to provide constraints on viscous rheology: assessing the role of calcic-amphibole in lithospheric strength, *AGU virtual meeting.*

27. #Mok, U., **Pec, M.** (2020) LAPS – a digital data repository workflow in experimental rock deformation, *AGU virtual meeting*.

28. *Seltzer, C., **Pec, M.,** Binzel, R., #Ghaffari, H. (2020) Strength of LL Chondrites in Laboratory Deformation Experiments with Applications to Internal Structure of 99942 Apophis. *T-9 conference, virtual*

29. Boneh, Y., **Pec, M.,** Hirth, G., (2020) The rheology of talc at high PT conditions with implications for subduction-zone dynamics. *AGU virtual fall meeting.*

30. Stünitz, H., Marti, S., Mansard, N., **Pec, M.,** Raimbourg, H., Précigout, J., Heilbronner R., (2020) The brittle-to-viscous transition and its potential relationship to seismic deformation. *EGU, virtual*

31. Tikoff, B., …. **Pec, M** (2020) StraboSpot digital data system: Incorporating the long tail data of the geological field sciences. *EarthCube Annual Meeting, virtual*

32. Huber, C., **Pec, M.,** Bachmann, O., (2020) Phase Separation in Mushy Magma Reservoirs, *JpGU, virtual meeting*

33. Stünitz, H., Marti, S., Mansard, N., **Pec, M.,** Raimbourg, H., Précigout, J., Heilbronner, R., (2020) The brittle-to-viscous transition and its potential relationship to seismic deformation. *EGU, Vienna, Austria*

34. Boneh, Y., **Pec, M.,** Hirth, G., (2020) The rheology of talc at high P-T conditions with implications for subduction-zone dynamics *EGU, virtual*

35. *Sun, H, **Pec, M.** (2019) Linear Viscous Flow of Nanocrystalline Fault Rocks at 300-500˚C, *AGU, San Francisco, CA*

36. *Seltzer, C, **Pec, M.** (2019) Deformation of Partially Molten Rocks at Lithospheric Temperatures and Pressures *AGU, San Francisco, CA*

37. #Ghaffari, H, #Mok, U, **Pec, M.** (2019) Developing an Ultrasound Probe Array for a High-Pressure, High-Temperature Solid Medium Deformation Apparatus. *AGU, San Francisco, CA*

38. #Condit, C., **Pec, M.,** Chin, E., Mitroi, T (2019) Experimental Investigation of Amphibole Rheology and Deforamtion Mechanisms at Deep Crustal Conditions. *GSA, Phoenix, AZ*

39. #Condit, C., Mahan, K., **Pec, M.,** Chin, E., (2019) Amphibole Rheology: Insights from Naturally Deformed Deep Crustal Rocks and High Temperaturte Deformation Experiments. *AGU, San Francisco, CA*

40. **Pec, M**., Holtzman, B., Zimmerman, M., Kohlstedt, D., (2019) Reactive Melt Channelization in the Earth's Mantle, *JpGU, Chiba, Japan*

41. Quintanilla-Terminel, **Pec, M.,** Jagoutz, O. (2019) Bringing Field and Laboratory Work into the Classroom by using on-line modules. *JpGU, Chiba, Japan*

42. **Pec, M.,** *Al Nasser, S. #Ghaffari, H. (2018) Deformation Mechanisms at the Base of the Seismogenic Layer. *(invited talk) AGU Washington D.C.*

43. Mighani, S., Bernabe, Y., Mok, U., **Pec, M.,** Evans, B., (2018) Can we use nanoindentation to derive the poroelastic parameters of microporous rocks? Experimental evidence. *American Rock Mechanics Association.*

44. #Ghaffari, H. and **Pec, M.**, (2018) Observation of a Topological Transition Point During Dynamic Failure of Brittle Solids. *Bulletin of the American Physical Society*.

45. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., (2017) The influence of Lithology on the Formation of Reaction Infiltration Instabilities in Mantle Rocks. **AGU**, 2017, New Orleans, U.S.A.

46. #Ghaffari, H.O., Griffith, W. A., **Pec, M.,** (2017) Supersonic Localized Excitations Mediate Microscopic Dynamic Failure. **AGU**, 2017, New Orleans, U.S.A.

47. **Pec, M.** (2017) Strain Partitioning and Localization in Granitoid Fault Rocks Deformed at Elevated Pressures and Temperatures, *(Invited talk)* **GSA**, 2017, Seattle, U.S.A.

48. Reber, J., **Pec, M.** (2017) The interaction between brittle- and dislocation creep in quartz, **GSA**, 2017, Seattle, U.S.A.

49. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., (2017) Experimental Insights on the Reactive Melt Migration in the Upper Mantle. *(Invited talk)* **Goldschmidt**, 2017, Paris, France

50. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., (2017) Reactive Melt Migration in the Upper Mantle **DRT**, 2017, Inverness, U.K

51. **Pec, M.,** Quintanilla Terminel, A., Holtzman, B., Zimmerman, M., Kohlstedt, D., (2016) Grain-scale alignment of melt in sheared partially molten rocks: implications for viscous anisotropy. **EGU**, 2016-9561, Vienna, Austria.

52. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., (2016) Morphology of melt-rich channels formed during reaction infiltration experiments on partially molten mantle rocks. **EGU**, 2016-9758, Vienna, Austria.

53. **Pec, M.,** Holtzman, B., Zimmerman, M., Kohlstedt, D., (2015) Reaction infiltration instabilities in partially molten rocks. **AGU**, DI31B-2576, San Francisco, U.S.A.

54. Heilbronner, R., **Pec, M.**, Stünitz, H., (2015) The viscous and frictional strength of faults in experiment and nature. **EGU**, EGU2015-4698, Vienna, Austria.

55. **Pec, M.,** Kohlstedt, D., Zimmerman, M., Holtzman, B. (2014) Reactive Melt Migration and Channelization in Partially Molten Rocks. **AGU**, MR42A-08, San Francisco, U.S.A.

56. Kohlstedt, D., **Pec, M.,** Holtzman, B. (2014) Influence of stress on melt topology in viscously deforming, partially molten rocks. *(Invited talk).* **Goldschmidt conference,** Sacramento, U.S.A.

57. **Pec, M.**, Stünitz, H., Heilbronner, R., Drury, M.R., (2013) Fault-related amorphous materials and their influence on the rheological behavior of fault zones. *(Invited talk)*. **AGU**, T23J-03, San Francisco, U.S.A.

58. **Pec, M.,** Kohlstedt, D., Zimmerman, M., Holtzman, B. (2013) Reactive melt migration in mantle rocks: an experimental study. **AGU**, T53B-2588, San Francisco, U.S.A.

59. **Pec, M.,** Kohlstedt, D., Zimmerman, M., Holtzman, B. (2013) An experimental study of reactive melt migration in mantle rocks. **DRT**, abstract volume pp 79, Leuven, Belgium.

60. **Pec, M.**, Stünitz, H., Heilbronner, R., Drury, M.R., De Capitani, C. (2012) Origin of pseudotachylites during slow creep experiments. **EGU**, Geophysical Research Abstracts, Vol. 14, EGU2012-10812, Vienna, Austria.

61. **Pec, M.**, Stünitz, H., Heilbronner, R. (2011) Slow pseudotachylites. **AGU**, T13A-2364, San Francisco, U.S.A,

62. Heilbronner, R., **Pec, M.**, Stünitz, H. (2011) Microstructure evolution of fault rocks at the 'brittle-to-plastic' transition. **AGU**, T13A-2345 San Francisco, U.S.A.

63. **Pec, M.**, Stünitz, H., Heilbronner, R. (2011) Slow pseudotachylites. **SGM,** abstracts volume pp 24, Zürich, Switzerland.

64. **Pec, M.**, Stünitz, H., Heilbronner, R. (2011) Rheology of granitoid fault rocks at the "brittle-to-plastic" transition: an experimental study. **DRT**, abstract volume, pp 97, Oviedo, Spain.

65. **Pec, M.**, Stünitz, H., Heilbronner, R. (2011) Semi-brittle deformation in shear experiments at elevated pressures and temperatures: Implications for crustal strength profiles. **CETeG**, "Travaux Géophysiques", Institute of Geophysics, Academy of Sciences of the Czech Republic, ISSN 0231-5548, Lísek, Czech Republic.

66. **Pec, M.**, Stünitz, H., Heilbronner, R. (2011) Brittle deformation in shear experiments at elevated pressures and temperatures. **EGU**, Geophysical Research Abstracts, Vol. 13, EGU2011-6072, Vienna, Austria.

67. Boutareaud, S., Hirose, T., Doan, M.L., Andréani, M., Calugaru, D.G., **Pec, M.**, Boullier A.M., Kunze, K., Cordonnier, B., (2011) Talc lubrication of faults at seismic velocities: an experimental approach. **EGU**, Geophysical Research Abstracts, Vol. 13, EGU2011-1158, Vienna, Austria.

68. **Pec, M.**, Stünitz H., Heilbronner R., (2010) The brittle-viscous transition in granitoid fault rocks. **Workshop on physico-chemical processes in seismic faults**, abstracts volume pp 21-22, Padova, Italy.

69. Boutareaud, S., Hirose, T., Doan, M.L., Andréani, M., Calugaru, D.G., **Pec, M.**, Boullier A.M., Cordonnier, B., (2010) Talc lubrication of faults at seismic velocities. **Workshop on physico-chemical processes in seismic faults.** abstract volume pp 21-22, Padova, Italy.

70. **Pec, M.**, Stünitz, H., Heilbronner, R. (2010) Localization and Partitioning of Deformation in Experimentally Produced Granitoid Fault Rocks. **EGU**, Geophysical Research Abstracts, Vol. 12, EGU2010-14206, Vienna, Austria.

71. **Pec, M.**, Stünitz, H., Heilbronner, R. (2010) Semi-brittle Flow in Granitoid Fault Rocks. **EGU**, Geophysical Research Abstracts, Vol. 12, EGU2010-14088, Vienna, Austria.

72. Goyette, J., John, B., Campbell-Stone, E., Stünitz, H., Heilbronner, R., **Pec, M.** (2009) Architecture of a low-angle normal fault zone, southern Basin and Range (SE California), **AGU**, T53C-1592, San Francisco, U.S.A.

73. **Pec, M.**, Stünitz, H., Heilbronner, R. (2009) Compaction and creep in experimentally deformed cataclasites. **DRT,** Liverpool, U.K.

74. **Pec, M.**, Stünitz, H., Heilbronner, R. (2009) Transition from frictional to viscous deformation in granitoid fault gouges. **SGM,** Tectonics and Geodynamics abstracts, pp 102-103, Neuchâtel, Switzerland.

75. **Pec, M.**, Heilbronner, R., Stünitz, H. (2009) Transition from frictional to viscous deformation in granitoid fault rocks. **EGU**, Geophysical Research Abstracts, Vol. 11 EGU2009-9776, Vienna, Austria.

76. **Pec, M.**, Stanek, M., Ulrich. S, Konopasek, J. (2008) Tectono-metamorphic evolution of the Aulus Basin metasediments in the vicinity of the Lherz peridotite massif, the North Pyrenean Metamorphic Zone. **CETeG**, Upohlav, Slovakia.

WORKSHOPS

FALL 2019	Kaufman Teaching Certificate for Junior Faculty, MIT
JUN. 2018	Leadership Skills for Engineering and Science Faculty
AUG. 2014	Gordon Research Conference & Seminar - Rock Deformation, Andover, NH, U.S.A.

DEC. 2013	MTEX workshop, San Francisco, CA, U.S.A.
AUG. 2012	Gordon Research Conference - Rock Deformation, Andover, NH, U.S.A.
AUG. 2012	Workshop on Advancing Experimental Rock Deformation Research: Scientific and Technical Needs, Harvard University, MA, U.S.A.
NOV. 2010	Experimental Petrology and Rock Deformation, EURISPET, ETH-Zürich, Switzerland.
AUG. 2010	Gordon Research Conference - Rock Deformation, Tilton, NH, U.S.A.
2012, 2011, 2010	Texture analysis and orientation imagining, Tromsø University, Norway. *(Teaching assistant)*
2012, 2011, 2010	Image analysis in Geosciences, Tromsø University, Norway. *(Teaching assistant)*
2012, 2011, 2010, 2009, 2008	Image analysis in Geosciences, Basel University, Switzerland. *(Teaching assistant)*
2011, 2010, 2009, 2008	Swiss Tectonic Group Excursion, The Alps.
JUL. 2007	Image analysis in Geosciences, Basel University, Switzerland. *(Participant)*
JUN. 2007	Conférence SUBCO - Géodynamique des Zones de Subduction, Montpellier, France.