

Yuan-Kai Liu

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Research Projects

Current projects at Caltech

- 2021–present A unified perspective of seismicity and fault coupling along the San Andreas
Advisor: Dr. Zachary E. Ross
- 2019–present Exploring the limits of imaging geodesy (InSAR) along the Gulf of Aqaba and the
 Dead Sea Transform.
Advisor: Dr. Mark Simons

Past projects (previous institutes)

- 2016–2018 Caldera collapses crustal deformation and modeling
Advisor: Dr. Sigurjón Jónsson
- 2012 Undergraduate research in earthquake scenario simulations
 Institute of Earth Science, Academia Sinica, Taipei, Taiwan.
Advisor: Dr. Shiann-Jong Lee

Education

- Aug. 2019 **California Institute of Technology (Caltech)**, California, USA
 –present *PhD in Geophysics option (in progress)*
 Seismological Laboratory, Division of Geological and Planetary Science
- Aug. 2019 **California Institute of Technology (Caltech)**, California, USA
 –Jun. 2021 *MSc in Geophysics option*
- Aug. 2016 **King Abdullah University of Science and Technology (KAUST)**, Saudi
 –Jun. 2018 Arabia
Master of Science in the Department of Earth Science and Engineering
- Sep. 2010 **National Taiwan University (NTU)**, Taipei, Taiwan
 –Jan. 2015 *Bachelor of Science* in the Department of Geosciences
Bachelor of Engineering in the Department of Civil Engineering

Standard Test Scores

Nov. 2015	GRE	Verbal 150 / Quantitative 170 / Analytical Writing 3.5
Oct. 2018	TOEFL	Total: 104 (Reading 27 / Listening 29 / Speaking 24 / Writing 24)

Awards

2017	Outstanding Student Poster and PICO Award (OSPP), EGU Meeting
2014	NTU Dean's Award (top-ranked students in the university four-year ranking)
2012	NTU Undergraduate Scholarship (tuition waiver for 2 years; equivalent to \$4,000)
2012	NTU Presidential Award (top-ranked students in the Department of Geosciences)

Memberships

2017–	American Geophysical Union
2017–	European Geosciences Union

Publications

Refereed journal articles

Liu, Y.-K., J. Ruch, H. Vasyura-Bathke and S. Jónsson, Influence of ring-faults in localizing surface deformation at subsiding calderas, *to be Submitted to Earth and Planetary Science Letters*.

Master's thesis dissertation

Ground deformation related to caldera collapse and ring-fault activity

Advisor: Dr. Sigurjón Jónsson

URL: <http://hdl.handle.net/10754/627773>

Conference posters

Liu, Y.-K., J. Ruch, H. Vasyura-Bathke & S. Jónsson, Ring-fault activity at subsiding calderas studied from analog experiments and numerical modeling, Abstract V23A-0467, 2017 Fall Meeting, AGU, New Orleans, Louisiana, 10–15 December, doi: [10.13140/RG.2.2.34897.43369](https://doi.org/10.13140/RG.2.2.34897.43369).

Liu, Y.-K., J. Ruch, H. Vasyura-Bathke and S. Jónsson, Contemporaneous ring fault activity and surface deformation at subsiding calderas studied using analog experiments, Geophys. Res. Abstracts 19, EGU2017-11792, doi: [10.13140/RG.2.2.14764.77442](https://doi.org/10.13140/RG.2.2.14764.77442).

Lin, C.-H., T.-C. Lin, Y.-R. Chang, **Y.-K. Liu**, S.-J. Lee, Twin of Chi-Chi earthquake? Numerical simulation study of Changhua and Chelungpu faults earthquake scenarios, 2012 Undergraduate summer project, Academia Sinica, Taiwan.

Talk contribution

Jónsson, S., W. Xu, J. Ruch, H. Vasyura-Bathke, **Y.-K. Liu** and Y. Aoki, One or two magma chambers under Galápagos volcanoes? Sentinel-1 and ALOS-2 data of the 2015 Wolf eruption offer clues, Fringe 2017.

Laboratory activity

Ruch, J., **Liu, Y.-K.** Development of the analog laboratory setup for caldera collapse analysis: simultaneous 3D time series of ground deformation coupled with 2D subsurface imaging.

Visiting and Internship

Visiting

2014	Tohoku University
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	3-week visiting at Sendai, Tohoku, Japan
Internship / Workshop	
2014	Schlumberger internship 2-week intern at Miaoli, Taiwan
2013	Mining and natural resources workshop at Bureau of Mines, Ministry of Economic Affairs, Taiwan
2012	Undergraduate summer research project at Academia Sinica, Taiwan

Fieldwork

2017	Carbonate geology: Ramp, platform, peritidal environment 3-day trip at Abu Dhabi, United Arab Emirates.
2015	Earthquake and tectonic geomorphology excursion 4-day trip at Hualien, Taiwan.
2014	Tohoku tectonic geomorphology: seismotectonic and tsunami study 10-day trip at Sendai, Tohoku, Japan.
2014	Tectonic geomorphology: active faults and paleo-river 3-day trip at Taichung, Taiwan.
2014	Paleoenvironment and stratigraphy characteristics 4-day trip at Tingalao River, Hualien, Taiwan
2013	Post-orogenic granite mapping 3-day trip at Matzu Island, Taiwan
2013	Ediacaran to Jurassic lithological mapping, tectonic events correlation 8-day trip at Wuhan, Hubei, China
2013	Summer geological survey 3: Metamorphic region 7-day trip at Hualien, Taiwan
2013	Summer geological survey 2: Volcanic region 7-day trip at Penghu Islands, Taiwan
2013	Summer geological survey 1: Sedimentary region 7-day trip at Hengchun Peninsula, Taiwan
2012	Volcanic tephra and lava outcrop mapping 4-day trip at Luta Island, Taiwan
2012	Taiwan carbon capture and storage pilot test Three weeks of on-site drilling at Xianxi, Changhua, Taiwan
2011	Earthquake hazard and structural geology 4-day trip at central Taiwan
2011	Structural geology 3-day trip at Hualien, Taiwan

Teaching

Jul. 2013	Scientific and mathematic tutor for 7-12th grade students
–Mar. 2015	

Military Service

Apr. 2015	Affiliation:	National Conscription Agency, Taiwan
–Mar. 2016	Service:	Civilian service
	Unit:	Public health center, Xizhi District, New Taipei City

Computer and Language Skills

Languages	English (fluent)	Chinese (native)	
Operating environments	MacOS	Windows	Linux
Programming	MATLAB Python (learning)	Fortran	basics of C and C++
Softwares	GMT Agisoft Photoscan	QGIS Adobe Suite	PIVlab Microsoft Office Suite