

## Yu-Huan Hsieh

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### Education

- August 2018 – present: **Ph.D. student in Department of Earth and Atmospheric Sciences, University of Houston**, under the supervision of John Suppe.
- Sept. 2012 - Dec. 2014: **M.S. in Institute of Oceanography, National Taiwan University**, Taiwan, with honors.
  - Thesis: Morphology, structures and seismic characters of the Chimei Canyon-Fan system offshore eastern Taiwan, under the supervision of Char-Shine Liu.
- Sept. 2008 - June 2012: **B.S. in Department of Geology, Chinese Culture University**, Taiwan, with honors.

### Working Experience (between MS. and Ph.D. studies)

- April 2018 – July 2018: **Research assistant at Ocean Center, National Taiwan University**, Taiwan, under the supervision of Char-Shine Liu.
- Aug. 2016 – March 2018: **Research assistant at Institute of Oceanography, National Taiwan University**, Taiwan, under the supervision of Char-Shine Liu.
- Feb. 2015 – July. 2016: **Research assistant at Department of Geosciences, National Taiwan University**, Taiwan, under the supervision of John Suppe.

### Awards and Honors

- May 2015 Best Master's Thesis Award (Vei Chow Juan Thesis Award) from the Taiwan Geological Society
- June 2012 Faculty Award from College of Science, Chinese Culture University
- May 2005 Outstanding Student Project Award (Honorable Mention) from 43th National Primary and High School Science Fair, central Taiwan group.

## Publications

- M. S. Thesis

Hsieh, Y. H. (2014). Morphology, structures and seismic characters of the Chimei Canyon-Fan system offshore eastern Taiwan, National Taiwan University Master Thesis, 110 p.

- Published paper:

Hsieh, Y. H., C. S. Liu, J. Suppe, T. B. Byrne, & S. Lallemand (2020), The Chimei submarine canyon and fan: A record of Taiwan arc-continent collision on the rapidly deforming overriding plate, *Tectonics*, 39, e2020TC006148.  
<https://doi.org/10.1029/2020TC006148>.

Huang, C. Y., W. H. Chen, M. H. Wang, C. T. Lin, S. Yang, X. Li, M. Yu, C. S. Liu, Y. H. Hsieh, & R. Harriss (2018). Juxtaposed sequence stratigraphy, temporal-spatial variations of sedimentation and development of modern-forming forearc Lichi Mélange in North Luzon Trough forearc basin onshore and offshore eastern Taiwan: An overview, *Earth-Science Reviews*, 182, p. 102-140.  
<https://doi.org/10.1016/j.earscirev.2018.01.015>

## Meeting Abstracts

Hsieh, Y. H., J. Suppe, C. S. Liu, H. H. Huang, R. Kanda, and M. Murphy, (2021), From the foreland and backarc thrust belts to the mantle transition zone: Multi-scale retrodeformable transect of the active 90mm/y Taiwan arc-continent collision, Abstract book of 2021 AGU Fall Meeting, New Orleans, LA, U. S. A., 13-17 December. (oral presentation)

Hsieh, Y. H., J. Suppe, and C. S. Liu, (2019), New strategy for multi-scale unfolding and restoration of the subducting South China Sea passive margin under the Taiwan collision, Abstract book of 2019 AGU Fall Meeting, San Francisco, U. S. A., 9-13 December. (oral presentation)

Hsieh, Y. H., J. Suppe, and C. S. Liu, (2019), Deformation of the Overriding plate in Taiwan Arc-continent Collision, Abstract book of 2019 GSA Meeting, Phoenix, Arizona, U. S. A., 22-25 September. (oral presentation)

Hsieh, Y. H., J. Suppe, and C. S. Liu, (2018), Active Retro-wedge Thrusting in the Philippine Sea Plate in the Taiwan Arc-Continent Collision: Evidence from retro-deformation of offshore depth-migrated seismic reflection profiles, Abstract book of 2018 AGU Fall Meeting, Washington D.C., U. S. A., 10-14 December. (oral presentation)

Suppe, J., Y. H. Hsieh, H. H. Huang, C. S. Liu, and M. LeBéon (2018), Massive

- subduction channels adjacent to Taiwan arc-continent collision, Abstract book of 2018 AGU Fall Meeting, Washington D.C., U. S. A., 10-14 December. (oral presentation)
- Hsieh, Y. H., C. S. Liu, J. Suppe, and H. H. Huang (2018), Insight into the structural setting of the 2018 Hualien earthquake sequence from offshore seismic-reflection profiles and tomography, Abstract book of 2018 Geological and Geophysical Meeting, Chia-Yi, Taiwan, 2-3 May, p. 112. (oral presentation)
- Hsieh, Y. H., J. Suppe, C. S. Liu, and H. H. Huang (2018), The transition from oceanic to continental subduction, illuminated by multi-scale deep transects of the oblique Taiwan arc-continent collision, The EGU General Assembly 2018, Vienna, Austria, 8-13 April. (PICO session)
- Suppe, J., Y. H. Hsieh, C. S. Liu, H. H. Huang, and M. LeBéon (2018), Subducting of continental rise, slope and shelf basins in Taiwan oblique arc-continent collision, The EGU General Assembly 2018, Vienna, Austria, 8-13 April.
- Suppe, J., Y. H. Hsieh, C. S. Liu, H. H. Huang, and M. LeBéon (2018), Subducting of continental rise, slope and shelf basins in Taiwan oblique arc-continent collision: Insight from tomography, surface geology, and seismic reflection data, Abstract book of 17th Symposium of Tectonic, Structural Geology and Crystalline Geology, Jena, Germany, 19-25 March, p. 126.
- Hsieh, Y. H., C. S. Liu, J. Suppe, T. B. Byrne, and S. Lallemand (2017), The Chimei submarine canyon and fan system: A record of Taiwan active tectonics and climate forcing, 2017 US–Taiwan Geoscience workshop (FACET II), Oregon State University, Oregon State, U. S. A., July 22-27. (poster)
- Hsieh Y. H., C. S. Liu, J. Suppe, S. Lallemand, and T. B. Byrne (2017), The Chimei submarine canyon and fan: A record of Taiwan arc-continent collision. JpGU-AGU Joint Meeting, Japan, May 20-25. (oral presentation)
- Suppe, J., Y. H. Hsieh, C. S. Liu and S. Carena (2017), Role of double subduction and retrowedge thrusting in consuming fast plate convergence in Taiwan arc-continent collision. JpGU-AGU Joint Meeting 2017, Japan, May 20-25.
- Hsieh, Y. H., J. Suppe, C. S. Liu, and S. Carena (2017), Role of double subduction and retrowedge thrusting in consuming fast plate convergence in Taiwan arc-continent collision, 2017 Inter-disciplinary Earth Science in Next Generation, Tainan, Taiwan, 10-11 May. (oral presentation)
- Lu, Y. W., C. S. Liu, G. W., Chen, Y. H. Hsieh, and A. Mirza (2017), The structures offshore the West Hengchun Hill, offshore southwestern Taiwan, 2017 Inter-disciplinary Earth Science in Next Generation, Tainan, Taiwan, 10-11 May.

- Chen, C. Y., C. S. Liu, and Y. H. Hsieh (2017), Crustal structure of the southernmost Ryukyu forearc region from large offset seismic data and gravity modelling, The EGU General Assembly 2017, Vienna, Austria, 23-28 April.
- Huang, J. K., C. S. Liu, and Y. H. Hsieh (2016), Morphology, structures and sedimentary processes of the Southern Longitudinal Trough, offshore southeastern Taiwan, Abstract book of 2016 AGU Fall Meeting, San Francisco, U. S. A., 12-16 December.
- Hsieh, Y. H., J. Suppe, C. S. Liu, and S. Carena (2016), The deep structure of retrowedge thrust belts: New insight from Taiwan and the role of secondary subduction, The EGU General Assembly 2016, Vienna, Austria, 18-22 April. (oral presentation)
- Hsieh, Y. H., and C. S. Liu (2015), An implication of the seismic sequences of the Chimei Canyon-Fan system in relation to arc-continent collision, Abstract book of 2015 US–Taiwan Geoscience workshop (FACET), Taipei, Taiwan, 28 May - 2 Jun, p. 42. (poster)
- Hsieh, Y. H., and C. S. Liu (2014), Morphology, structures and seismic characters of the Chimei Canyon-Fan system offshore eastern Taiwan, Abstract book of 2014 AGU Fall Meeting, San Francisco, U. S. A., 15-19 December. (poster)
- Hsieh, Y. H., and C. S. Liu (2014), Morphological and seismic characters of the Chimei Canyon-Fan system offshore eastern Taiwan, Abstract book of 2014 Geological and Geophysical Meeting, Hualien, Taiwan, 14-15 May, p. 61. (oral presentation)
- Hsieh, Y. H., and C. S. Liu (2012), The structures and sedimentary processes of the Chimei submarine canyon offshore eastern Taiwan, Abstract book of 2012 Geological and Geophysical Meeting, Taoyuan, Taiwan, 17-18 May, p. 357. (poster)

## **Skills**

- Seismic data processing (6 years experience):
  - 2D post-stack time migration using ProMAX
  - Advanced seismic reflection data processing using ProMAX:
    - Dip moveout correction
    - Wave equation multiple rejection (WEMR)
    - KLT (eigenvector) multiple attenuation
  - 2D post-stack time migration using ECHOS
  - Advanced seismic reflection data processing using ECHOS:

- Surface related multiple attenuation (SRMA)
- Radon multiple attenuation (RADNPAR)
- 2D pre-stack time migration (PSTM) using ECHOS and GeoDepth
- 2D pre-stack depth migration (PSDM) using Geodepth
- Velocity model building using Geodepth
- Data integration and interpretation:
  - Kingdom Suite
  - Gocad
  - StructuralSolver (advanced seismic structure interpretation tools)
  - Petrel (limited)
- Computer skills:
  - Linux system
  - Programming using Bash
  - Generic Mapping Tools (GMT)
  - Geographic analysis using ArcGIS
  - Illustration with CorelDraw and Illustrator

## **Other Functions Performed**

(All research experience as the point of work)

- Organized workshops (National Taiwan University)
  - Organizer of the Marine Seismic Methods Workshop taught by Dr. Frauke Klingelhoefer (French Research Institute for Exploitation of the Sea, Brest, France). This workshop was held at the Institute of Oceanography, National Taiwan University, 13-22 Nov. 2017. I helped Dr. Frauke Klingelhoefer on organizing the workshop and setup computers and software.
  - Organizer of the Workshop on Tectonics of Taiwan and the South China Sea hosted by the Ocean Center of the National Taiwan University, 16 Oct. 2017.
- Taught seismic data processing lab (National Taiwan University)
  - The teaching assistant for Seismic data processing course (for graduate students), 2016 and 2017 Spring semesters. This course is for M.S. and Ph.D. students coming from two universities. I taught practiced hand-on seismic data processing skills using ECHOS and Geodepth.
  - The training teacher for seismic data processing using ECHOS and GeoDepth, 4 weeks, Jan. 2016. This is a workshop for Seismic Exploration Lab, IONTU. I taught seismic data processing using ECHOS and GeoDepth.
  - The teaching assistant for seismic data processing course (for graduate students),

2013 Fall and 2015 Spring semester. This course is for M.S. and Ph.D. students coming from two universities. I taught hand-on seismic data processing skills using ProMAX.

- Geological field work (National Taiwan University)
  - Teaching assistant for Geological Survey, Introduction to Field Geology, Summer Field Camp, 2015 Spring semester. This course is for international students. I gave help in guiding fundamental skills in field and leading the discussion after each day's work.
- Teaching assistant experience (Chinese Culture University)
  - Teaching assistant for General Geology and Mineral Science, from 2009 to 2010. I helped professor with guiding fundamental skills in laboratory and commenting and correcting students' homework.
  - Teaching assistant for Introduction to Geotechnical Engineering and Introduction to Rock Mechanics, from 2010 to 2012. I helped professor with commenting and correcting students' homework.

## Research Interests

- **Tectonics:** I am interested in crustal-scale tectonics and structural geology, and the interaction between near-surface processes and crustal structures. I am especially fascinated with arc-continent collision, arc-arc collision, and continent-continent collision. I am currently working on understanding the depositional processes of Taiwan arc-continent collision by interpreting the structures and seismic sequences of the northern Huatung Basin adjacent to the Taiwan mountain belt. I am also studying the structures of retro-wedge thrust belts to understand how the forearc basin and arc deformed during the arc-continent collision and what is the role of secondary subduction using bathymetry, seismic reflection, and tomography data. I would like to broaden my experiences to other tectonic environments.
- **Processes of submarine canyon-fans:** Submarine canyons deliver sediments from source areas to surrounding deep-sea basin and then form submarine fans. Therefore, submarine canyons and fans could preserve important clues of tectonic events of the source to sink processes. I am really fascinated with the processes of submarine canyon-fans because submarine fans preserve the long-term of stratigraphic records of orogeny which are usually not easy to preserve onshore. Hence, studying submarine canyons and fans can help to understand the tectonics or mountain building more completely by finding onshore missed stratigraphic records in the

submarine fan. I am preparing a paper that is near submission on this topic: The Chimei submarine canyon and fan: A record of Taiwan arc-continent collision. In this study, we show the Chimei canyon and fan by seismic reflection data applying seismic stratigraphic and advanced structural interpretation methods and interpret the relationship between offshore and onshore stratigraphic records to understand the Taiwan arc-continent collision processes.

- **Seismic reflection data processing and interpretation:** Seismic reflection studies are an effective approach to unveil underground and undersea structures and strata. A high quality of the seismic reflection profile is helpful to interpret and understand structures and stratigraphic architecture more clearly. Therefore, I am processing seismic reflection data with noise and multiple attenuations in order to enhance signal-to-noise ratio, as well as get a good velocity model from velocity analysis to stack and migrate seismic data for getting clearer images. However, some deeper structures, such as décollements, are usually obscure on seismic profiles. Hence, I am also interested in structural interpretation, such as fault-related folds and growth strata to constrain deep décollements, fault ramps, and fault-slip history.