

## Jupiter Hansen (Cheng), Ph.D. candidate

Department of Geology, University of Georgia  
Email: [jupiterchc@uga.edu](mailto:jupiterchc@uga.edu)

### Education

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**Doctor of Philosophy (Ph.D.) | The University of Georgia (UGA)** *Current Overall GPA: 4.00/4.00*  
Aug 2019 – Present (expected May 2023)

- Geology Department: Center for Planetary Tectonics

**Master of Philosophy (MPhil) | The University of Hong Kong (HKU)**  
Sep 2017 – Aug 2019

- Earth Science Department: Tectonics and planetary science

**Bachelor of Science (BSc) | The University of Hong Kong (HKU)**  
Sep 2013 – Aug 2017

- Major in Geology and Minor in Geography

### Research Experience

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**Doctoral Research | The University of Georgia (UGA)**

Aug 2019 – Present (expected 2023)

- **Thesis committee:** Dr. Christian Klimczak (Advisor), Dr. Rob Hawman (Internal), Dr. Steven Holland (Internal), Dr. Caleb Fassett (External; JHU Applied Physics Laboratory)
- **Research Topic:** The tectonics of 4 Vesta (Thesis title: TBD)
- Detailed structural mapping, crater counting, and rock mechanical calculations to study the tectonic of Asteroid Vesta focusing on the large-scale troughs and Rheasilvia basin
- Mapping polygonal impact craters to reveal the hidden tectonic patterns on Vesta and Ceres
- Fieldwork on Koa'e Fault System in Hawaii to investigate mixed-mode fracturing in an extensional tectonic regime and its displacement-length (D/L) scaling

**Master Research | The University of Hong Kong (HKU)**

Sep 2017 – Aug 2019

- **Supervisors:** Dr. A. Alexander G. Webb and Dr. Joseph Michalski
- **Thesis Title:** Geological and structural mapping of Ishtar terra margins on Venus: Implications for crustal plateau evolution.

**Visiting Student | Hampton University (HU)**

Nov 2018

- **Research mentor:** Dr. William B. Moore
- Numerical modeling on the internal structures and temperature profiles of heat-pipe Venus

**Undergraduate Thesis | The University of Hong Kong (HKU)**

Sep 2016 – Apr 2017

- **Supervisors:** Dr. A. Alexander G. Webb (primary) and Dr. Joseph Michalski
- **Thesis Title:** Geological mapping on Venus highland margins to test the heat pipe hypothesis

### Peer-reviewed Publications

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**Cheng, H. C. J., and Klimczak, C. (2022).** Structural relationships in and around the Rheasilvia basin on Vesta. *Journal of Structural Geology*, 161, 104677. <https://doi.org/10.1016/j.jsg.2022.104677>

**Cheng, H. C. J., and Klimczak, C. (2022).** Large-scale troughs on Asteroid 4 Vesta accommodate opening-mode displacement. *Journal of Geophysical Research: Planets*, 127, e2021JE007130. <https://doi.org/10.1029/2021JE007130>

**Cheng, H. C. J., Klimczak, C., and Fassett, C. I. (2021).** Age relationships of large-scale troughs and impact basins on Vesta. *Icarus*, 366, 114512. <https://doi.org/10.1016/j.icarus.2021.114512>

## Publications in Preparation

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- Cheng, H. C. J.,** Klimczak, C. and Mrazek, J. (in prep) The Transition from Jointing to Faulting: Observations from the Koe'a Fault System, Volcanoes National Park, Hawai'i. *Prepared for GSA Bulletin*
- Cheng, H. C. J.,** and Klimczak, C. (in prep). Latitudinal variations in structure dominate the tectonics of Vesta and Ceres. *Prepared for Icarus.*

## Abstracts and Conference Presentations (Presenter\*)

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- Cheng, H. C. J.\*** and Klimczak, C. "Structure and Tectonics of the Divalia Fossae on 4 Vesta." Lunar and Planetary Science Conference. Vol. 54. 2023. Abstract #1015. The Woodlands, TX, USA
- Cheng, H. C. J.\*** and Klimczak, C. "Structure and Tectonics forming Divalia Fossae on Vesta." *28th Meeting of the NSAS Small Bodies Assessment Group.* 2023. Invited Talk. Pasadena, CA, USA
- Cheng, H. C. J.\*,** Klimczak, C. and Mrazek, J. "Displacement-Length Scaling of the Mixed-Mode Koa'e Fault Zone, Hawai'i, HI." *American Geophysical Union Fall Meeting 2022.* Abstract [#1063059](#)
- Cheng, H. C. J.\*.** "Simulated Structural Geology Fieldwork in Classrooms to Bridge the Gap between Knowledge and the Field." *American Geophysical Union Fall Meeting 2022.* Abstract [#1064954](#)
- Cheng, H. C. J.\*** and Klimczak, C. "Tectonic Map of Ceres from Polygonal Impact Craters." *Lunar and Planetary Science Conference.* Vol. 53. 2022. Abstract [#1020](#) Virtual poster presentation.
- Cheng, H. C. J.\*,** and Klimczak, C. "A Structural Map of the Rheasilvia basin on Vesta." *Geological Society of America Abstracts with Programs.* Vol 53, No. 6, 2021 [Abstract #43-1](#) Oral presentation. Portland, OR, USA, doi: 10.1130/abs/2021AM-366538.
- Cheng, H. C. J.\*,** and Klimczak, C. "The large-scale troughs on Asteroid 4 Vesta are opening-mode fractures." *European Geosciences Union General Assembly 2021.* PS3.1 – Small Bodies and Dust — Open Session. Oral presentation. Virtual meeting.
- Cheng, H. C. J.\*,** Klimczak, C. and Fassett, C. I. "Age Relationships of Large-Scale Troughs and Impact Basins on Vesta." *Lunar and Planetary Science Conference.* Vol. 52. 2021. Abstract [#1014](#) Oral presentation. Virtual meeting.
- Cheng, H. C. J.\*** and Klimczak, C. "Systematic Fracture Pattern on Vesta Revealed by Polygonal Impact Craters." *Lunar and Planetary Science Conference.* Vol. 52. 2021. Abstract [#1015](#) Poster presentation. Virtual meeting.
- Hirabayashi, M.\*, Fassett, C. I., Montalvo, P., **Cheng, H. C. J.** and Klimczak, C. "Efficient Topographic Degradation on Ceres as Revealed by the Equilibrium Population of Small Craters." *Lunar and Planetary Science Conference.* Vol. 52. 2021. Abstract [#1585](#) Poster presentation. Virtual meeting.
- Cheng, H. C. J.\*** and Klimczak, C. "Opening-Mode Fractures are an Alternative Explanation for Large-Scale Troughs on Asteroid 4 Vesta." *23<sup>rd</sup> Meeting of the NSAS Small Bodies Assessment Group.* 2020. Invited Early Career Talks. Virtual meeting.
- Cheng, H. C. J.\*** and Klimczak, C. "Opening-mode fractures are an alternative explanation for large-scale troughs on Asteroid 4 Vesta." *Lunar and Planetary Science Conference.* Vol. 51. 2020. Abstract [#1002](#) \*Meeting canceled due to COVID-19
- Cheng, H.C.J.\*,** Webb, A.A.G., Michalski, J.R. and Moore, W.B. "Testing crustal plateau formation models for Venus using geological mapping of Ishtar Terra marginal areas." *Lunar and Planetary Science Conference.* Vol. 50. 2019. Abstract [#1332](#). Poster presentation. The Woodlands, TX, USA

## Other Publications and Presentations (Presenter\*)

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- Klimczak, C., Beddingfield, C. B., Byrne, P. K., **Cheng, H. C. J.,** Crane, K. T. and Annex, A. +28 signatories "Opportunities and Challenges for Structural Geology and Tectonics in the Planetary Sciences." *Planetary Science and Astrobiology Decadal Survey 2023-2032* white paper. 133; Bulletin of the American Astronomical Society, Vol. 53, Issue 4, 133

## Scientific Community Contributions & Experiences

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**Executive Secretary**, NASA Discovery Data Analysis Program (DDAP) Review Panel  
**Executive Secretary**, NASA Solar System Workings (SSW) Program Review Panel  
**Executive Secretary**, NASA Lunar Data Analysis Program (LDAP) Review Panel  
**Student Advisory Members**, GSA Planetary Geology Division, *October 2021 to present*  
**Session Chairperson and Co-convener**, GD1.1 – Causes of dynamic, tectonic, and compositional transitions in the Earth and rocky planets, *European Geosciences Union General Assembly 2021*.  
**DART Boarder**, Double Asteroid Redirection Test (DART) Mission Boarder Program, *14-18 June 2021*  
**InSightSeers**, InSightSeers Program, Mentor: Dr. Paul Morgan, *28 June – 2 July 2021*

## Research Awards & Grants

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**Watts Wheeler Research Award** | Department of Geology | University of Georgia | 2021 **\$1500**  
**Frank E. Kottowski Memorial Grant** | AAPG Foundation Grants-in-Aid Award | 2021 **\$3000**  
**The Eugene M. Shoemaker Impact Cratering Award** | GSA Planetary Geology Division | 2020 **\$3000**

## Travel Grants

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**Early-career Travel Award** | NASA Small Bodies Assessment Group | 2023 **\$2000**  
**AGU 2022 Fall Meeting Student Travel Grant** | American Geophysical Union | 2022 **\$1000**  
**Domestic Travel Grants** | UGA Graduate School | 2022 **\$900**  
**Watts Wheeler Travel Award** | Department of Geology | University of Georgia | 2022 **\$620**  
**GSA Meeting Division Travel Grant** | GSA Planetary Geology Division | 2021 **\$500**  
**Domestic Travel Grants** | UGA Graduate School | 2021 **\$425**  
**Watts Wheeler Travel Award** | Department of Geology | University of Georgia | 2020 **\$800**  
**Travel Support for Research Postgraduate Students** | The University of Hong Kong | 2018 **\$1300**

## Teaching Experience

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**GEOL 4060/6060L Structural Geology** | UGA – **Teaching Assistant** Spring 2021, 2022, and 2023  
**GEOL 1121L Earth Processes and Environments Lab** | UGA – **Instructor** Fall 2019 to Fall 2022

- Course Evaluations:

Semester	Enrollment	Evaluations	Overall Rating: Instructor
Fall 2019	26	17	4.4/5
Spring 2020	17	4	4.3/5
Fall 2022	32	15	4.8/5

**GEOL 1121 Earth Processes and Environments** | UGA – **Teaching Assistant** Spring 2020 to Fall 2022  
**Geology Field School: Geologic mapping in ArcGIS Pro** | UGA – **Instructor** Summer 2022  
**GEOL 3000 Alien Worlds** | UGA – **Teaching Assistant** Fall 2021  
**GEOL 4360/6360 Introduction to Rock Mechanics** | UGA – **Teaching Assistant** Fall 2021  
**EASC3405 Environmental Remote Sensing** | HKU – **Teaching Assistant** Spring 2018 and 2019  
**Undergraduate Taiwan Field Trip** | HKU – **Teaching Assistant** Jan 2019  
**EASC4407/6407 Regional Geology** | HKU – **Teaching Assistant** Fall 2017 and 2018

\*1000–4000: Introductory to advanced undergraduate-level courses; 6000: Graduate-level courses

## Undergraduate and Graduate Research Mentored

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- Davis Gray Hardin, B.S. 2023 (UGA), *Crater Saturation Equilibrium on Asteroid 4 Vesta*, Major advisor: Dr. Christian Klimczak
- Jay Mrazek, B.S. 2024 (UGA), *Mixed-mode fracturing along Koa'e fault system in Hawaii*, Major advisor: Dr. Christian Klimczak
- Yat Hei Siu, M.S. 2021 (HKU), *Mapping topography of Venus for testing crustal plateau formation models*, Major advisor: Dr. A. Alexander G. Webb
- Chit Yan Leung, B.S. 2019 (HKU), *Testing Corona formation models on Venus via structural mapping*, Major advisor: Dr. A. Alexander G. Webb

## Academic Services, Awards & Experiences

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**Co-organizer of TA Café: *Teaching Resources 101* at UGA** | Nov 2022

**UGA Outstanding Teaching Assistant Award** | April 2022

**Co-organizer of TA Café – *Teaching Untethered: Taking Your Teaching Outside* at UGA** | March 2022

**UGA Future Faculty Fellow** | 2022

**UGA Women in Science Mentorship Program – Co-mentor** | Fall 2021 – Spring 2022

**UGA Geology Faculty Learning Community Member** | Spring 2021 – Spring 2022

**UGA Graduate Student Association – Graduate Council Representative** | Fall 2020 – Spring 2021

**UGA Geology Graduate Student Representative** | Fall 2020 – Spring 2021

## Languages

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<b>English</b>	<b>Cantonese</b>	<b>Mandarin</b>
(full professional proficiency)	(native)	(full professional proficiency)

## Computer Skills

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<b>Microsoft Office</b>	<b>Adobe Illustrator / Inkscape</b>	<b>R</b>
<b>ArcGIS Pro/ArcMap</b>	<b>ENVI</b>	<b>MATLAB / Octave</b>

## Industry Experience

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**Summer Intern | Tysan Foundation Geotechnical Limited (Hong Kong)** Jul – Aug 2016

## Impact and Media Exposure

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University of Georgia. "[Geologists propose theory about a famous asteroid](#)". UGA Today, 1 September 2021.