Chi Yan

Earth and Planets Laboratory
Carnegie Institution for Science, Washington, DC 20015 – USA
+1 443-509-5630 • cyan@carnegiescience.edu • chiyan.me

Current Affiliation

Carnegie Institution for Science **Washington DC, USA**
Postdoc, Earth and Planets Laboratory *2023-present*

Education

The Johns Hopkins University **Baltimore, MD, USA**
Ph.D., Planetary Science *2016-2021*

Thesis: The Role of Stable Layers and External Thermal Perturbations on Planetary Dynamos

Advisor: Dr. Sabine Stanley

University of Toronto **Toronto, ON, Canada**
M.Sc., Physics *2015-2016*

Nanjing University **Nanjing, JS, China**
B.Sc., Physics Honors *2011-2015*

Research Experience

Carnegie Institution for Science **Washington DC**
Postdoc Fellow (Supervisor: Peter Driscoll, Cian Wilson) *2023-present*

Numerical Modeling of Thermo-chemical Convection in Earth's Core and Implications for Geodynamo Evolution

Johns Hopkins University **Baltimore, MD**
Postdoc Fellow (Advisor: Sabine Stanley) *2021-2023*

Investigations of Saturn's Interior from Cassini Magnetic Field Observations

Johns Hopkins University **Baltimore, MD**
Graduate Research Assistant (Advisor: Sabine Stanley) *2016-2021*

- investigate the ancient hemispheric dynamo as a potential cause of Mar's present-day crustal magnetic field
- probe deep interior structures of Saturn using magnetic data from the Cassini Grand Finale
- constrain properties of the stable layer atop Earth's core with paleomagnetic record over the past 10^4 years

Publications

[5]: **Chi Yan**, Ankit Barik, Sabine Stanley, Anna Mittelholz, Catherine L. Johnson, Ana-Catalina Plesa and Attilio Rivoldini, "Mars' hemispheric magnetic field from a full-sphere dynamo", *submitted*

[4]: Zheng Gong, Davies Evans, Zhongtian Zhang, and **Chi Yan**, "Mid-Proterozoic geomagnetic field was more consistent with a dipole than a quadrupole", *Geology*, 51,(2023)

[3]: **Chi Yan**, Ankit Barik, Sabine Stanley, Jason Leung, Anna Mittelholz, Catherine L. Johnson, Ana-Catalina Plesa and Attilio Rivoldini, "An ancient Martian dynamo driven by hemispheric heating: effect

of thermal boundary conditions", *Plant. Sci. J*, 4, 11 (2023)

[2]: **Chi Yan** and Sabine Stanley, "Recipe for a Saturn-like dynamo", *AGU Advances*, 2 (2021)

[1]: **Chi Yan** and Sabine Stanley, "Sensitivity of the geomagnetic octupole to a stably stratified layer in the Earth's core", *Geophys. Res. Lett*, 45, (2018)

Research Proposal Involvement

National Science Foundation
Thermo-chemical Convection in Earths Core and Implications for Geodynamo Evolution *2023-2025*

NASA Cassini Data Analysis Program (CDAP), Selected
Investigations of Saturn's Interior from Cassini Magnetic Field Observations *2021-2024*

InSight Science Team (MAG working group)
Mars' Core Evolution and Magnetic Field Generation *2020-2023*

Invited Seminars and Colloquia

Planetary Physics Department Seminar, DLR, German Aerospace Center, Germany *2022*

Colloquium at Dept of Physics and Astronomy, Oberlin College, OH, USA *2021*

PLunch Seminar at Departments of AA & EPS, University of California, Santa Cruz, CA, USA *2021*

General Seminar at EPL, Carnegie Institution for Science, Washington DC, USA *2020*

Forum at Dept. Astronomy and Space Science, Nanjing University, China *2019*

Selected Conference Proceedings

[11]: **Yan, C.**, Barik, A., Stanley, S., et al., Probing Mars' Ancient Magnetic Mysteries with Full Sphere Dynamo Simulations, *AGU Fall meeting*, 2023 **[Invited]**

[10]: **Yan, C.**, Barik, A., Stanley, S., Stable Layers: The Catalyst for Dipolar Dominated Magnetic Fields in Gas Giants, *DPS-EPSC*, 2023

[9]: Barik, A., **Yan, C.**, Moore, K., et al., Comparison of Jupiter's and Saturn's magnetic fields and implications for their interiors, *AGU Fall meeting* , 2022

[8]: **Yan, C.**, Barik, A., Stanley, S., The role of stably stratified layers in separating deep and shallow dynamos, *AGU Fall meeting* , 2022

[7]: **Yan, C.**, Barik, A., Stanley, S., Plesa, A-C. and Rivoldini, A., Mittelholz, A and Johnson, C., Full sphere dynamo models for Mars' ancient magnetic field, *AGU Fall meeting* , 2021

[6]: **Yan, C.**, Barik, A., Plesa, A-C., Rivoldini, A., and Stanley, S., Sensitivity of the ancient martian dynamo to hemispheric CMB heat flux patterns, *AGU Fall meeting* , 2020

[5]: **Yan, C.** and Stanley, S., Recipe for a Saturn-like Dynamo, *AGU Fall meeting* , 2019 **[Invited]**

[4]: **Yan, C.** and Stanley, S., Recipe for a Saturn-like Dynamo, *Theo Murphy Royal Society Meeting: Revealing Saturn's deep interior for the first time with Cassini*, 2019

[3]: **Yan, C.** and Stanley, S., Sensitivity of the Geomagnetic Octupole to a Stably Stratified Layer in the Earth's Core, *Study of Earth Deep Interior*, 2018

[2]: **Yan, C.** and Stanley, S., Sensitivity of the Geomagnetic Octupole to a Stably Stratified Layer in the Earth's Core, *AGU Fall meeting*, 2017

[1]: **Yan, C.** and Stanley, S., Sensitivity of the Geomagnetic Octupole to a Stably Stratified Layer in the Earth's Core, *Gordon Research Conference: Interior of the Earth*, 2017

Teaching Experience

Guest Lectures

Johns Hopkins University	*Baltimore, MD*
AS.270.404 Planetary Interiors	*2022,2021,2019*
AS.270.114 Guided Tour: The Planets (Planetary Dynamos)	*2020*
AS.270.684 Mathematical Methods (Fourier Series)	*2020*
AS.270.425 Earth and Planetary Fluids (Boundary Layers) (2 lectures)	*2019*

Mentoring Experience

Johns Hopkins University	*Baltimore, MD*
Mentoring an undergraduate student for a summer research project	*2022*
AS.270.605 EPS Colloquium, TA	*2020*
AS.270.114 Guided Tour: The Planets, TA	*2020*
University of Toronto	*Toronto, ON*
PHY131/132 Introduction to Physics I,II	*2015-2016*

Professional Service

Reviewer:
Journal of Geophysical Research: Planets
Cassini at Saturn: The Grand Finale, by Cambridge University Press (one chapter)
National Science Foundation (NSF)

Computational Skills

Language: Chinese (native), English (fluent), Japanese (Conversational)
Dynamo Codes: *mMoSST*, *MagIC*, *Rayleigh*
Languages: ForTran, Python, C++, MatLab,LaTex,Bash
Parallel Programming: MPI, OpenMP
HPC batch schedulers: SLURM, PBS

Additional Training

○ JHU Safe Zone Training	*2022*
○ JHU Teaching Academy – Teaching Institute Certificate Program	*2020*
○ UofT SciNet – Certificate in Scientific High Performance Computing	*2016*