

## Ue-Li Pen

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### Education

1996	Ph.D. in Astrophysics Princeton University
1991	Master of Science, National Chiao-Tong University
1989	Bachelor of Science National Taiwan University

### Fields of Specialty

I am a theoretical astrophysicist who studies systems where basic physical effects can be isolated from astronomical complexities. My research projects include Fast Radio Burst (FRB) and pulsar lensing, non-linear dynamics of the cosmic neutrino background, 21cm intensity mapping, leading to the Canadian Hydrogen Intensity Mapping Experiment (CHIME). My work on 21 cm intensity mapping opens a new window for the precision study of dark energy and neutrinos. My use of natural plasma in our galaxy as a giant telescope spawned the field of scintillometry, enabling new glimpses into enigmatic pulsars and the unsolved fast radio bursts.

### Academic and Other Employment History

2021-Present	Director Academia Sinica Institute of Astronomy & Astrophysics
2011–Present	Professor Canadian Institute for Theoretical Astrophysics
2016–2019	Director Canadian Institute for Theoretical Astrophysics
2003–2011	Associate Professor Canadian Institute for Theoretical Astrophysics
1998–2003	Assistant Professor Canadian Institute for Theoretical Astrophysics
1995–1998	Junior Fellow Harvard University

## Honours and Awards

2022	NSERC Brockhouse Canada <i>as part of CHIME Telescope Team</i>
2022	Fellow of Royal Society of Canada(FRSC)
2021	Lancelot Berkeley Prize
2020	Governor General's Innovation Award <i>as part of CHIME Telescope team</i>
2019	2020 Breakthrough Prize in Fundamental Physics <i>as part of Event Horizon Telescope team</i>
2018	Humboldt Prize
2018	Simons Investigator Award
1995–1998	Harvard Junior Fellow
1994–1995	Princeton Porter Ogden Jacobus Fellowship

## Selected Publications

1. The Event Horizon Telescope Collaboration (2019). First M87 Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole. *The Astrophysical Journal Letters*, 875(1), L1.  
DOI: [10.3847/2041-8213/ab0ec7](https://doi.org/10.3847/2041-8213/ab0ec7)
2. The CHIME/FRB Collaboration (2019). A second source of repeating fast radio bursts. *Nature* 566, 235–238. DOI: [10.1038/s41586-018-0864-x](https://doi.org/10.1038/s41586-018-0864-x)
3. Robert Main, I-Sheng Yang, Victor Chan, Dongzi Li, Fang Xi Lin, Nikhil Mahajan, Ue-Li Pen, Keith Vanderlinde, Marten H van Kerkwijk (2018). Pulsar emission amplified and resolved by plasma lensing in an eclipsing binary. *Nature* 557, 522-525. DOI: <https://doi.org/10.1038/s41586-018-0133-z>
4. The CHIME/FRB Collaboration (2020). A bright millisecond-duration radio burst from a Galactic magnetar. *Nature* 587, 54–58. <https://doi.org/10.1038/s41586-020-2863-y>
5. The CHIME/FRB Collaboration (2020). A repeating fast radio burst source localized to a nearby spiral galaxy. *Nature* 577, 90-194. DOI: <https://doi.org/10.1038/s41586-019-1866-z>

## Research Projects executed in the past five years

2018-2023	Thoth Technology Project Title: Real-time VLBI
2019-2024	NSERC-Discovery Project Title: Short time domain coherent radio astronomy
2018-2023	NSERC-CRD Project Title: Real-time VLBI
2018-2022	IDC Project Title: International Doctoral Cluster Initiative
2018-2023	ORF-RE Project Title: Smart Handling of Big Data
2018-2023	NSERC Project Title: Pulsar Scintillometry
2017–2018	OCE Project Title: Optimization of astrophysical simulation performance on accelerator platforms
2017-2019	CIFAR Project Title: Exploration of CHIME-FRB-VLBI capability