

## **Ying Liao (廖瑩)**

Research Center for Environmental Changes (RCEC), Academia Sinica

No. 128, Sec. 2, Academia Rd., Nankang, Taipei, Taiwan 115

Email: [yliao115@gate.sinica.edu.tw](mailto:yliao115@gate.sinica.edu.tw)

Lab website link: [www.rcec.edu.tw](http://www.rcec.edu.tw)

### **EDUCATION**

2013/02 – 2017/03 Ph.D. Depart. of Physics, University of Bern, Switzerland

2009/09 – 2012/06 M.S. Institute of Astronomy, National Central University, Taiwan

2005/09 – 2009/06 B.A. Depart. of Electronics Engineering, National Central Uni., Taiwan

### **EMPLOYMENT**

2023/02 - present Postdoctoral Researcher RCEC, Academia Sinica, Taiwan

2021/08 - present Assistant Professor (adjunct) National Tsing Hua Uni., Taiwan

2019/12 - 2021/07 Assistant Research Fellow Origin Space Co., Ltd.

2018/01 - 2019/10 Postdoctoral Researcher Macau Uni. of Science and Technology, Macau

### **HONORS & AWARDS**

2019 Championship, CubeSat Mission Design Contest, iCASE, Taiwan

2018 Innovation award, NASA Space Apps Challenge, Taiwan

2017 *Magna cum laude* (5.0), PhD final assessment, Switzerland

### **PROFESSIONAL SERVICE**

➤ Director, *Taiwan Institute of Planetary Science and System Engineering (TIPSSE)*

### **RESEARCH INTEREST**

My research interest lies in contributing to a deeper understanding of small bodies in the Solar System and shaping conceptual space missions bound for Near-Earth Asteroids. Small Solar System Bodies (SSSB) include comets, asteroids, Centaurs, Trans-Neptunian Objects and interplanetary dust. Small bodies are considered keys to shed light on the formation and evolution of the Solar System as they may preserve pristine materials of the young solar nebula from which the planets formed.

Among the small bodies, I focus on comets in particular. Most of my current research applies numerical modeling on the physical characteristics of comets to interpret observational results from remote and in situ investigations by ground telescopes and spacecrafts. I employ Direct Simulation Monte Carlo (DSMC) approach, develop a general modeling procedure and analyze large panel data sets to study the outgassing activity and near-nucleus environment of comets. The significance of relevant physical parameters in the models has been identified. The modeling procedure has been successfully applied to several comets (e.g., 67P/Churyumov-Gerasimenko, 46P/Wirtanen, and

133P/Elst-Pizarro) to investigate their behavior and various related physical problems. At the moment I am also conducting studies of designing low-cost, short-duration CubeSat missions targeting asteroids.

#### **REPRESENTATIVE PUBLICATIONS** (\*: corresponding author)

1. **Y. Liao** and Y. K. Liao\*, Comet 46P/Wirtanen's debut: a guide for stargazers, *Science Monthly*, 588, 2018.
2. **Y. Liao**\*, R. Marschall, C. C. Su, J. S. Wu, M. Rubin, and N. Thomas, Water Deposition from the inner gas coma onto the nucleus of Comet 67P/ Churyumov-Gerasimenko, *Planetary and Space Science*, 157, 1-9, 2018.
3. **Y. Liao**\*, C. C. Su, R. Marschall et al., 3D Direct Simulation Monte Carlo Modelling of the Inner Gas Coma of Comet 67P/ Churyumov-Gerasimenko: A Parameter Study, *Earth Moon & Planets*, 117, 41-64, 2016.

#### **INVITED TALKS**

1. CAG Seminar, National Taiwan Normal University, Taiwan (2022)
2. AOGS 2019, Singapore (2019)