

# Pakorn Wongwaitayakornkul

📍 Department of Physics, Thammasat University, Pathum Thani, Thailand  
🔗 [tpakorn.github.io](https://tpakorn.github.io) ✉ [pwongwai@tu.ac.th.edu](mailto:pwongwai@tu.ac.th.edu)

---

## PROFESSIONAL INTERESTS

Plasma Physics, Spheromaks, Solar Physics, Nuclear Fusion, MHD Instabilities, Numerical Simulation

## EDUCATION AND POSITION

<b>Thammasat University</b> Lecturer in Department of Physics	2021 – Present Pathum Thani, TH
<b>University of California, San Diego</b> Postdoctoral Scholar in Department of Physics	2020 – 2021 La Jolla, CA
<b>California Institute of Technology</b> M.S. & Ph.D. in Applied Physics GPA: 4.1/4.0	2014 – 2020 Pasadena, CA
<b>William Marsh Rice University</b> B.S. in Physics B.A. in Computational and Applied Mathematics GPA: 4.03/4.00, <i>Summa Cum Laude</i>	2010 – 2014 Houston, TX

## PUBLICATIONS

- **P. Wongwaitayakornkul**, J. R. DANIELSON, N. C. HURST, D. H. E. DUBIN, AND C. M. SURKO, *Inviscid damping of an elliptical vortex subject to an external strain flow*, Physics of Plasma 29, 052107 (2022)
- **P. Wongwaitayakornkul**, H. LI, AND P. M. BELLAN, *3D Numerical Simulation of Kink-Driven Rayleigh–Taylor Instability Leading to Fast Magnetic Reconnection*, The Astrophysical Journal Letters, 895, L7 (2020)
- B. SEO, **P. Wongwaitayakornkul**, M. A. HAW, R. S. MARSHALL, H. LI, AND P. M. BELLAN, *Determination of a Macro- to Micro-scale Progression Leading to a Magnetized Plasma Disruption*, Physics of Plasma 27, 022109 (2020)
- Y. Zhang, **P. Wongwaitayakornkul**, AND P. M. BELLAN, *Magnetic Rayleigh-Taylor Instability in an Experiment Simulating a Solar Loop*, The Astrophysical Journal Letters 889, L32 (2020)
- **P. Wongwaitayakornkul**, M. A. HAW, H. LI, AND P. M. BELLAN, *Magnetically Induced Current Piston for Generating Extreme-Ultraviolet Fronts in the Solar Corona*, The Astrophysical Journal 874 (2), 137 (2019)
- M. A. HAW, **P. Wongwaitayakornkul**, H. LI, AND P. M. BELLAN, *Reverse Current Model for Coronal Mass Ejection Cavity Formation*, The Astrophysical Journal Letters 862 (2), L15 (2018)
- **P. Wongwaitayakornkul**, M. A. HAW, H. LI, S. LI, AND P. M. BELLAN, *Apex Dips of Experimental Flux Ropes: Helix or Cusp?*, The Astrophysical Journal 848 (2), 89 (2017)

## RESEARCH EXPERIENCE

### Surko Positron Research Group

La Jolla, CA

Advisor: Clifford M. Surko

2020 – 2021

- Monitor and maintain cryogenics for superconducting magnets
- Investigate a dynamics of electron vortices subjected to imposed strain flows using Penning–Malmberg trap and particle-in-cell simulation

### Bellan Plasma Group

Pasadena, CA

Advisor: Paul M. Bellan

2014 – 2020

- Designed an experiment of an arched plasma-filled flux rope with prefill gas to study CME magnetic morphology and its shock-driving mechanism
- Constructed multiple langmuir probes for ion density measurement
- Measured and analyzed experimental data from magnetic probes, Langmuir probes, spectroscopic camera and fast multi-images camera
- Proposed and verified models with numerical simulation and observational satellite data

### Summer Undergraduate Research Fellow

2012 & 2013

- Constructed a 3D high-speed magnetic probe for measuring whistler wave
- Imaging plasmas with coded aperture methods instead of conventional optics

### Los Alamos National Laboratory

Los Alamos, NM

Advisor: Hui Li and Shengtai Li

2016 – 2020

- Adapted 3D MHD code (LA-COMPASS) to simulate Caltech plasma arched flux rope experiment
- Examined MHD instabilities and magnetic reconnection using the adapted LA-COMPASS and compared them to the events observed in Caltech plasma laboratory

### Texas Children Hospital

Houston, TX

Advisor: Craig Rusin and Matthias Heinkenschloss

2013 – 2014

- Developed a software for a noninvasive method to measure cardiac pressure using echocardiogram
- Improved the current preprocessing smoothing scheme of the echocardiogram data

### The Killian Research Group

Houston, TX

Advisor: Thomas Killian

2011 – 2013

- Designed and constructed a tellurium frequency reference system for re-pumping laser during laser-cooling of Strontium (Senior Thesis)
- Aligned and set up diode laser optics for spectroscopy of tellurium at various temperatures
- Wrote a Mathematica program for visualizing magnetic field for a vacuum chamber design
- Constructed a strontium source nozzle
- Designed a strontium beam collimator and mount pieces

## AWARDS

2009 – 2020	Full Scholarship from <i>Development and Promotion of Science and Technology Talents Project</i> to study Physics through Doctoral Degree in USA
2014	Summa Cum Laude from Rice University
2013	Louise J. Walsh Scholarship in Engineering from Rice University
2013	Summer Undergraduate Research Fellowships 2013 from California Institute of Technology
2012	Undergraduate Poster Award for outstanding presentation from American Physics Society-Division of Plasma Physics 54 <sup>th</sup> Annual Meeting, Providence, Rhode Island
2012	Summer Undergraduate Research Fellowships 2012 from California Institute of Technology
2012	Samuel T. Sikes, Jr. Scholarship in Engineering from Rice University
2010	Summa Cum Laude from Worcester Academy
2008	Bronze Medalist as Thai representatives in the 9th Asian Physics Olympiad, Mongolia
2008	Granted Research Fund from the Thailand Research Fund in Young Rubber Researchers Project, Thailand
2007	Gold Medal (rank 2nd) and The Best Theory Award from the 6th Thailand Physics Olympiad organized by The Promotion of Academic Olympiads and Development of Science Education Foundation, Thailand

## TEACHING EXPERIENCE

Lecture: Give lecture, Hold office hours, Quiz and Grade assignments

2022 – Present SC 134: Physics for Engineering 2

2022 – Present PC 316: Introduction to Fluid Mechanics

Teaching Assistance: Leading discussion classes, Holding office hours, Grading

2016 – 2019 APh 156: Plasma Physics

Spring 2013 CAAM 210: Introduction to Computational Engineering

Spring 2012 CAAM 336: Differential Equations in Science and Engineering

Fall 2013 PHYS 101-102: Introductory Physics

## CONFERENCE PRESENTATIONS

- 2021 P. WONGWAITAYAKORNKUL, J. R. DANIELSON, N. C. HURST, D. H. E. DUBIN, AND C. M. SURKO, *Inviscid damping of an elliptical vortex in an external strain flow*, APS DFD Meeting 2021, Pheonix, AZ (Oral)
- 2021 P. WONGWAITAYAKORNKUL, J. R. DANIELSON, N. C. HURST, D. H. E. DUBIN, AND C. M. SURKO, *Inviscid damping of the  $m=2$  mode on a two-dimensional vortex subject to a strain flow*, APS DPP Meeting 2021, Pittsburgh, PA (Poster)
- 2020 P. WONGWAITAYAKORNKUL AND P. M. BELLAN, *Dynamics of an Arched Magnetically-Twisted Current-Carrying Plasma: Dip, Cavity, Shock, and Instability*, APS DPP Meeting 2020, virtual (Oral)
- 2020 P. WONGWAITAYAKORNKUL, J. R. DANIELSON, N. C. HURST, D. H. E. DUBIN, AND C. M. SURKO, *An Elliptical Model for Inviscid Damping of a Smooth Vortex Under an Applied Strain Flow*, APS DPP Meeting 2020, virtual (Poster)
- 2019 P. WONGWAITAYAKORNKUL, B. SEO, M. A. HAW, R. S. MARSHALL, H. LI, AND P. M. BELLAN, *Sausage to Kink Instability Transition-Induced Fast Magnetic Reconnection*, SHINE 2019, Boulder, CO (Poster)
- 2018 P. WONGWAITAYAKORNKUL, M. A. HAW, H. LI, AND P. M. BELLAN, *Magnetically Induced Current Piston for Generating Extreme-Ultraviolet Fronts in the Solar Corona*, APS DPP Meeting 2018, Portland, OR (Oral)
- 2018 P. WONGWAITAYAKORNKUL, M. A. HAW, H. LI, AND P. M. BELLAN, *Magnetically Induced Current Piston for Generating Extreme-Ultraviolet Fronts in the Solar Corona*, SHINE 2018, Cocoa Beach, FL (Poster)
- 2018 P. WONGWAITAYAKORNKUL, M. A. HAW, H. LI, AND P. M. BELLAN, *Magnetically Induced Current Piston for Generating Extreme-Ultraviolet Fronts in the Solar Corona*, COSPAR 2018, Pasadena, CA (Poster)
- 2017 P. WONGWAITAYAKORNKUL, M. A. HAW, AND P. M. BELLAN, *Differential Acceleration due to Density Perturbation, Oblique Shock, and Magnetically-Driven Axial Flow in Caltech Experimental Flux Rope*, SHINE 2017, Saint-Sauveur, Quebec (Poster)
- 2017 P. WONGWAITAYAKORNKUL, M. A. HAW, AND P. M. BELLAN, *Caltech Solar Experiment*, IPELS 2017, San Diego, CA (Poster)
- 2016 P. WONGWAITAYAKORNKUL, P. M. BELLAN, H. LI, AND S. LI, *Collision Experiment of an Arched Plasma-Filled Flux Rope and a Target Cloud of Initially Neutral Gas*, APS DPP Meeting 2016, San Jose, CA (Poster)
- 2016 P. WONGWAITAYAKORNKUL AND P. M. BELLAN, *Measurements from the Collision Experiment of an Arched Plasma-Filled Flux Rope and a Target Cloud of Initially Neutral Gas*, SHINE 2016, Santa Fe, NM (Poster)
- 2015 P. WONGWAITAYAKORNKUL AND P. M. BELLAN, *Collision of an Arched Plasma-Filled Flux Rope with a Target Cloud of Initially Neutral Gas*, APS DPP Meeting 2015, Savannah, GA (Poster)
- 2015 P. WONGWAITAYAKORNKUL AND P. M. BELLAN, *Collision of an Arched Plasma-Filled Flux Rope with a Target Cloud of Initially Neutral Gas*, SHINE 2015, Stowe, VT (Poster)
- 2013 P. WONGWAITAYAKORNKUL, X. ZHAI, AND P. M. BELLAN, *A 3D High-Speed Probe for Measuring the Magnetic Components of a Whistler Wave*, APS DPP Meeting 2013, Denver, CO (Poster)
- 2012 P. WONGWAITAYAKORNKUL AND P. BELLAN, *Imaging plasmas with coded aperture methods instead of conventional optics*, APS DPP Meeting 2012, Providence, RI (Poster)

## COMPUTER SKILLS

**Proficient:** Python, MATLAB, Mathematica, L<sup>A</sup>T<sub>E</sub>X, Inkscape

**Basic:** Labview, Fortran, SolidWorks, AutoCAD, IDL, C/C++/C#, ExpressPCB

## LABORATORY SKILLS

High-frequency electronics, Vacuum technology, Plasma diagnostics, Imaging Technique, Cryogenics, Laser/Optics, Circuit board design, Machining

## REFERENCES

*References available upon request.*