

# Hongtao Zhong

Ph.D. Candidate   Advanced Combustion and Propulsion Lab   hongtaoz@princeton.edu   Homepage

## EDUCATION

### PRINCETON UNIVERSITY

PH.D. IN MECHANICAL AND  
AEROSPACE ENGINEERING  
Sept 2017 - Present | Princeton, NJ  
Cum. GPA: 3.975 / 4.0

### TSINGHUA UNIVERSITY

B.E. IN ENERGY AND POWER  
ENGINEERING  
Sept 2013 - Jun 2017 | Beijing  
Department of Thermal Engineering  
B.EC. IN ECONOMICS  
Sept 2014 - Jun 2017 | Beijing  
School of Economics and Management  
Cum. GPA: 90 / 100

## AWARDS

2020 BRITT AND ELI HARARI  
FELLOWSHIP  
2018 SAYRE AWARD  
2017 KING PEH KWONG  
FELLOWSHIP  
2016 TSINGHUA ACADEMIC  
SCHOLARSHIP  
2014 CHINESE NATIONAL  
SCHOLARSHIP

## TEACHING

MAE 335 FLUID DYNAMICS  
2020 Fall  
MAE 426 ROCKET AND  
AIR-BREATHING PROPULSION  
TECHNOLOGY  
2020 Spring  
MAE 221 THERMODYNAMICS  
2019 Fall  
MAE 340 INDEPENDENT WORK  
2019 Spring

## EXPERIENCE

UNIVERSITY OF CAMBRIDGE  
Jul 2016 - Aug 2016 | Cambridge, UK  
RESEARCH ASSISTANT

LUND UNIVERSITY  
Mar 2016 - Jun 2016 | Lund, Sweden  
EXCHANGE STUDENT

## RESEARCH

### THERMAL-CHEMICAL INSTABILITY OF WEAKLY IONIZED PLASMA

May 2018 - Present | Advised by Prof. Yiguang Ju and Dr. Mikhail Shneider

### LASER DIAGNOSTICS AND KINETIC STUDIES IN FUEL OXIDATION

Mar 2018 - Present | Advised by Prof. Yiguang Ju

## PUBLICATIONS

- [1] **Zhong, H.**, Shneider, M. N., Mao, X., & Ju, Y. (2020). "Linear Stability Analysis of Plasma Thermal-Chemical Instability". *Plasma Sources Science and Technology*, 2020, Submitted.
- [2] **Zhong, H.**, Yan, C., Teng, C. C., Chen, T., Wysocki, G., & Ju, Y. (2020). "Kinetic Studies of Excited Singlet Oxygen Atom O(<sup>1</sup>D) Reactions with Ethanol". *International Journal of Chemical Kinetics*, 2020, Under Review.
- [3] **Zhong, H.**, Teng, C. C., Yan, C., Ma, G., Wysocki, G., & Ju, Y. (2020). "Kinetic Study of Reaction C<sub>2</sub>H<sub>5</sub> + HO<sub>2</sub> in a Photolysis Reactor with Time-Resolved Faraday Rotation Spectroscopy". *Proceedings of the Combustion Institute*, 2020, Accepted.
- [4] **Zhong, H.**, Mao, X., Rousso, A., Patrick, C., Yan, C., ... & Ju, Y. (2020). "Kinetic Study of Plasma-assisted N-dodecane/O<sub>2</sub>/N<sub>2</sub> Pyrolysis and Oxidation in a Nanosecond-pulsed Discharge". *Proceedings of the Combustion Institute*, 2020.
- [5] **Zhong, H.**, Shneider, M. N., Mokrov, M. S., & Ju, Y. (2019). "Thermal-Chemical Instability of Weakly Ionized Plasma in a Reactive Flow". *Journal of Physics D: Applied Physics*, 52(48), 484001.
- [6] Yan, C., Yang, X., Zhao, H., **Zhong, H.**, Ma, G., ... & Ju, Y. (2020). "Controlled Dy-doping to Nickel-rich Cathode Materials in High Temperature Aerosol Synthesis". *Proceedings of the Combustion Institute*, 2020, Accepted.
- [7] Yan, C., Teng, C. C., Chen, T., **Zhong, H.**, Rousso, A., ... & Ju, Y. (2020). "Kinetic Study of Excited Singlet Oxygen Atom O(<sup>1</sup>D) Reactions with Acetylene". *Combustion and Flame*, 212, 135-141.
- [8] Teng, C. C., Yan, C., **Zhong, H.**, Rousso, A., ... & Wysocki, G. (2018). "HO<sub>2</sub> Radical Measurements in a Photolysis Reactor using Line-Locked Faraday Rotation Spectroscopy". In *Optics and Photonics for Energy and the Environment (pp. EW3A-6)*. Optical Society of America.
- [9] Fan, L., McGrath, D., ..., **Zhong, H.**, & Hochgreb, S. (2018). "Laser-induced incandescence particle image velocimetry (LII-PIV) for two-phase flow velocity measurement". *Experiments in Fluids*, 59(10), 156.

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## RESEARCH

### PRESENTATIONS

- [1] "Stability Analysis of Thermal-Chemical Instability in a Weakly Ionized Plasma". Oral. AIAA Scitech 2021 Forum, Virtual (01/2021)
- [2] "2D Modeling of Controlled Non-equilibrium Plasma for  $H_2/O_2/N_2$  Ignition using a Hybrid Nanosecond and DC Discharge". Oral. AIAA Scitech 2021 Forum, Virtual (01/2021)
- [3] "Contraction and Stability of the Positive Column of a Self-sustained Glow Discharge in a Reactive Mixture". Oral. 73<sup>rd</sup> Annual Gaseous Electronics Conference, Virtual (10/2020)
- [4] "Thermal-Chemical Plasma Instability in a Reacting Flow". Oral. AIAA Scitech 2020 Forum, Orlando, FL (01/2020)
- [5] "Dynamic Contraction of the Positive Column of a Self-sustained Glow Discharge in a Reacting Flow". Oral. 72<sup>nd</sup> Annual Gaseous Electronics Conference, College Station, TX (11/2019)
- [6] "An Analysis of a New Thermal-Chemical Mechanism for Plasma Combustion Instability in Plasma Assisted Ignition". Oral. 11<sup>th</sup> US National Combustion Meeting, Pasadena, CA (03/2019)
- [7] "Kinetic Studies of Excited Singlet Oxygen Atoms  $O(^1D)$  Reactions with Fuels in Plasma Assisted Combustion". Oral. AIAA Scitech 2019 Forum, San Diego, CA (01/2019)
- [8] "Direct Measurements of Branching Ratios of  $O(^1D)$  Reactions with Alcohols". Oral. 15<sup>th</sup> International Conference on Fluid Dynamics, Sendai, Japan (11/2018)

## ACTIVITIES

### ACSSPU CHINESE LUNCH EVENT

May 2018 - May 2019 | Princeton

Organized weekly Chinese Lunch Event (1,600 person-times participation).

### ALMGREN MEMORIAL MAYDAY RUNNING RACE

May, 2019 | Princeton

Participated as a member of Princeton ACSSPU Team (Ranked 4 / 8)

### TSINGHUA SIYUAN PROGRAM

May, 2014 - May, 2017 | Beijing, Shaanxi & Shanghai, China

Participated and Trained in social services with the theme of "Receive Help, Self-Help and Help Others".

### SUMMER SERVICE AND LEARNING PROGRAM (SSLP) IN RURAL CHINA

Jul, 2014 | Inner Mongolia & Hebei, China

Offered voluntary teaching to middle schools and primary schools in rural areas of China.