LUND UNIVERSITY

Jinguo Sun

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➢ EDUCATION

2022.09 – now **Post-doc researcher**	Division of Combustion Physics, Lund University (Advisor: Prof. Andreas Ehn)
2017.09 – 2022.07 **Ph. D**.	Department of Energy and Power Engineering, Tsinghua University (Supervisor: Prof. Shuiqing Li)
2019.12-2020.12 **Visiting scholar**	Institute for Combustion Technology, RWTH Aachen (Supervisor: Prof. Heinz Pitsch)
2013.09 – 2017.07 **B.E.**	Department of Energy and Power Engineering, Tsinghua University, Beijing, China

➢ RESEARCH INTERESTS

- Plasma-assisted combustion for hydrocarbon and carbon-free fuels (NH_3).
- Advanced optical diagnostics; Electric field/Plasma-flame interaction modeling.
- Combustion instability; Swirl flames dynamics.

➢ PUBLICATIONS

✓ 20+ papers in energy/combustion/plasma-related peer-reviewed journals and conferences, such as *Combustion and Flame, Proceedings of the Combustion Institute, Fuel, Energy & Fuels, Applications in Energy and Combustion Science*.

✓ (Google Scholar: https://scholar.google.com/citations?user=gsfMcpUAAAAJ&hl=en)

✓ 4 patents (One U.S. patent and three China patents)

- *Published*

1. Yipeng Li, **Jinguo Sun**, Qian Huang, Reinhold Kneer, Shuiqing Li*. Experimental investigation on the effects of air/fuel distribution on stability limit and NO_x emission of NH_3/CH_4 flame. *Combustion and Flame* 268 (2024): 113606.
2. Can Ruan, Zhiyong Wu*, **Jinguo Sun**, Niklas Jüngst, Edouard Berrocal, Marcus Aldén, Zhongshan Li. Ignition, stabilization and particle-particle collision in lifted aluminum particle cloud flames. *Proceedings of the Combustion Institute* 40.1-4 (2024): 105596.
3. **Jinguo Sun***, Jonas Ravelid, Yupan Bao, Sebastain Nilsson, Alexander A. Konnov, Andreas Ehn. Dynamics of atomic oxygen production in an NH_3/air flame assisted by a nanosecond pulsed plasma discharge**.** *Proceedings of the Combustion Institute* 40.1-4 (2024): 105477
4. **Jinguo Sun*,** Yupan Bao, Jonas Ravelid, Sebastian Nilsson, Alexander A. Konnov, Andreas Ehn. Plasma-assisted NH_3/air flame: Simultaneous LIF measurements of O and OH. *Combustion and Flame* 266 (2024): 113529.
5. Sebastian Nilsson, David Sanned, Adrian Roth, **Jinguo Sun**, Edouard Berrocal, Mattias Richter, Andreas Ehn*. Holistic analysis of a gliding arc discharge using 3D tomography and single-shot fluorescence lifetime imaging. *Communications Engineering* 3.1 (2024): 103.
6. Sam Taylor*, Filip Hallböök, Rob Temperton, **Jinguo Sun**, Lisa Rämisch, Sabrina Gericke, Andreas Ehn, Johan Zetterberg, Sara Blomberg*. In-situ ambient pressure photoelectron spectroscopy study of the plasma-surface interaction on metal foils. *Langmuir* 40 (2024): 13950−13956
7. **Jinguo Sun*,** Yupan Bao, Jonas Ravelid, Sebastian Nilsson, Alexander A. Konnov, Andreas Ehn. Application of emission spectroscopy in plasma-assisted NH_3/air combustion using nanosecond pulsed discharge. *Combustion and Flame* 263 (2024): 113400.
8. **Jinguo Sun**, Yihua Ren, Yong Tang, Shuiqing Li*. Influences of heat flux on extinction characteristics of

steady/unsteady premixed stagnation flames. *Proceedings of the Combustion Institute*, 38.2 (2022): 2305-14.

9. **Jinguo Sun**, Yong Tang, Shuiqing Li*. Plasma-assisted stabilization of premixed swirl flames by gliding arc discharges. *Proceedings of the Combustion Institute* 38.4 (2021): 6733-6741.
10. **Jinguo Sun**, Wei Cui, Yong Tang, Chengdong Kong, Shuiqing Li*. Inlet pulsation-induced extinction and plasma-assisted stabilization of premixed swirl flames. *Fuel* 328 (2022): 125372.
11. **Jinguo Sun**, Qian Huang, Yong Tang, Shuiqing Li*. Stabilization and Emission Characteristics of Gliding Arc-Assisted NH_3/CH_4/Air Premixed Flames in a Swirl Combustor. *Energy & Fuels* 36.15 (2022): 8520-8527.
12. **Jinguo Sun**, Hu Wu, Yong Tang, Chengdong Kong, Shuiqing Li*. Blowout Dynamics and Plasma-Assisted Stabilization of Premixed Swirl Flames under Fuel Pulsations. *Application in Energy and Combustion Science*, 14 (2023): 100122.
13. Yupan Bao, Chengdong Kong, Jonas Ravelid, **Jinguo Sun**, Sebastian Nilsson, Elias Kristensson, Andreas Ehn*. Effect of a single nanosecond pulsed discharge on a flat methane-air flame. *Applications in Energy and Combustion Science* (2023): 100198.
14. Yuanping Yang, Qian Huang, **Jinguo Sun**, Peng Ma, Shuiqing Li*. Reducing NO_x emission of swirl-stabilized ammonia/methane/air tubular flames through fuel-oxidizer mixing strategy. *Energy & Fuels*, 36.4 (2022): 2277-2287.
15. Yong Tang, **Jinguo Sun**, Baolu Shi, Shuiqing Li, Qiang Yao*. Extension of flammability and stability limits of swirling premixed flames by AC powered gliding arc discharges. *Combustion and Flame* 231 (2021): 111483.
16. **Jinguo Sun,** Yupan Bao, Jonas Ravelid, Andreas Ehn*. Emission spectroscopy of nanosecond pulsed plasma discharges in ammonia/air flames. *25th International Symposium on Plasma Chemistry*, Kyoto, Japan, 2023.
17. Jonas Ravelid, **Jinguo Sun**, Vassily Kornienko, Yupan Bao, Elias Kristensson, Andreas Ehn. Spatial and Temporal Investigation of Atomic Oxygen Generation from ns-Pulsed Plasma using TAPLIF. *25th International Symposium on Plasma Chemistry*, Kyoto, Japan, 2023.
18. Hu Wu, **Jinguo Sun**, Shaolong Li, Yong Tang, Wei cui, Shuiqing Li*. Plasma-assisted stabilization of premixed swirl flames under flow pulsations, *13th Asia-Pacific Conference on Combustion*, Abu Dhabi, United Arab Emirates, 2021.
19. **Jinguo Sun**, Wei Cui, Shuiqing Li*. Large-eddy simulation of premixed swirl flame dynamics under pulsating flow disturbances, *12th Asia-Pacific Conference on Combustion*, Fukuoka, Japan, 2019.

- ***Under peer-review***

20. **Jinguo Sun**, Yupan Bao*, Kailun Zhang, Alexander A. Konnov, Mattias Richter, Elias Kristensson, Andreas Ehn. A Comprehensive Study on Dynamics of Flames in a Nanosecond Pulsed Discharge. Part II: Plasma-Assisted Ammonia and Methane Combustion. (Under review in *Combustion and Flame*)
21. Yupan Bao*, Kailun Zhang, **Jinguo Sun**, Tomas Hurtig, Mattias Richter, Elias Kristensson, Andreas Ehn. A Comprehensive Study on Dynamics of Flames in a Nanosecond Pulsed Discharge. Part I: Discharge Formation and Gas Heating. (Under review in *Combustion and Flame*)
22. Liwei Zhou, **Jinguo Sun**, Andreas Ehn, Liqiu Wei*. Study on the difference of dielectric barrier discharge characteristics between carbon dioxide and air. (Under review in *Science Advances*)

- ***Patents***

23. Shuiqing Li, Minhang Song, **Jinguo Sun**, Qian Huang. (2023): Atmosphere-adjustable multi-staged swirl ammonia burner. United States Patent (Patent No US011747014B2).
24. Shuiqing Li, Minhang Song, **Jinguo Sun**, Yuanping Yang, Qian Huang. (2021): Axial tangential multi-stage swirling ammonia-doped burner with adjustable atmosphere. China Patent (Patent No ZL202110923877.8)
25. **Jinguo Sun**, Liangliang Dai, Yuxin Ke, Xingfang Liang. (2020): An improved phosphorus diffusion furnace. China Patent (Patent No ZL201922245564.2)
26. Shuiqing Li, Hu Wu, Wei Cui, Yihua Ren, **Jinguo Sun**. (2019): Direct control method and equipment for swirl burner stability under plasma excitation. China Patent (Patent No ZL201910040680.2)

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➢ Awards and scholarships

- 2022, **Outstanding Paper Award**, Combustion Academic Annual Conference, Chinese Society of Engineering Thermophysics (Top 1% per year)
- 2022, paper was selected as **journal cover** of *Energy & Fuels*
- 2021, **Comprehensive Scholarship (G1)** for Ph.D. students at Tsinghua University
- 2019, **Chinese Scholarship Council** for joint Ph.D. student
- 2014–2016 (three consecutive years), **Comprehensive Scholarship (G1)** for B.E. students at Tsinghua University

➢ ORAL PRESENTATIONS (International)

25th International Symposium on Plasma Chemistry	2023.05	Kyoto, Japan
13th Asia-Pacific Conference on Combustion	2021.12	Abu Dhabi, UAE
38th International Combustion Symposium (**2 talks**)	2020.01	Adelaide, Australia
17th International Conference on Numerical Combustion	2018.05	Aachen, Germany
12th Asia-Pacific Conference on Combustion	2017.07	Fukuoka, Japan

➢ PEER-REVIEWER

In the past two years, I have reviewed a total of 6 papers for

- *Proceedings of the Combustion Institute*
- *Combustion Science and Technology*
- *International Journal of Hydrogen Energy*

➢ PROJECT

LAPLAS: Advanced Laser Diagnostics for Discharge Plasma

2022.09–now *European Research Council (ERC)* *852394*

- Served as a main researcher on plasma-assisted ammonia combustion.

Electrical and Plasma Assisted Combustion Instability Control for Jet Engine under Extreme Conditions

2017.01–2020.12. *National Natural Science Funds of China* *91641204*

- Served as a main researcher and wrote completion report; also contributed to the proposal writing.

➢ SKILLS

- **Languages**: Chinese Mandarin (Native), English (Fluent)
- **Experiments:** mainly in optical diagnostics, including LIF, PIV, TDLAS, Chemiluminescence.
- **Simulations**: OpenFOAM, CHEMKIN, Cantera & ZDPlasKin (Proficient), COMSOL & Fluent (Intermediate).
- **Programming**: Matlab & Python (Proficient), C++ & Fortran (Intermediate).
- **Data processing**: Proper orthogonal decomposition, Abel-inversion, 3D reconstruction, *et al.*