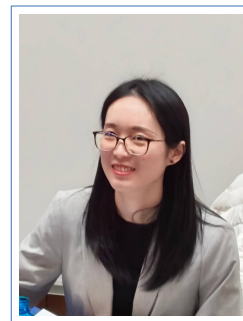


# Yue Qiu

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## Professional Summary

An Engineering PhD graduate with 5+ years of combined industry and research experience in thermal and flow simulations:

- 💻 Proficient in CFD-based multiphysics simulation with Flotherm, ANSYS Fluent, and OpenFOAM. Well-versed in solver development, implementation, and HPC optimization across academic and industrial projects.
- 🔧 Demonstrated ability in experimental validation and benchmarking to assess solver performance and sensitivity.
- 🖋️ Strong programming skills in C++, Python, and MATLAB with experience in data analysis, automated testing and simulation workflows.
- 🎓 Strong background in heat transfer, thermodynamics, and fluid mechanics, providing a thorough understanding of CFD theories and numerical algorithms.
- 😊 Experienced in effective collaboration across R&D divisions and the manufacturing teams for innovative engineering solutions.

## Industry & Research Experience

### Lund University

2025 Apr. – **PhD researcher, Department of Physics.**

- 2025 Aug.
  - Developed and tested a multi-region biomass pellet pyrolysis model to enable the prediction of temperature evolution, species distribution, and pellet shrinkage.
  - Developed a heterogeneous kinetic solver to compare pyrolysis mechanisms and validate the results against the experimental Thermogravimetric (TG) data.

### Lund University

2021 Jan. – **PhD researcher, Department of Physics.**

- 2025 Apr.
  - Conducted an extensive literature review on the physio-chemical properties of metallic particles (Iron and Aluminum) under high-T conditions, with applications for more efficient energy release.
  - Developed two advanced CFD solvers in OpenFOAM Eulerian and Lagrangian frameworks to model the transient multiphase heat and mass transfer under extreme conditions.
  - Collaborated closely with the experimental teams, using optical diagnostic techniques to validate models and enhance the understanding of metallic particle combustion behavior under extreme conditions.

## Finisar Corp. (Now Coherent Corp.)

- 2019 Dec. **Thermal Engineer, R&D.**  
–2020 Dec.
  - Conducted CFD simulations with Flotherm to optimize thermal-fluid performance of high-speed optical transceivers, ensuring reliability under diverse conditions.
  - Designed and performed wind-tunnel tests to validate and update models.
  - Developed a standardized database and test manual for Thermal Interface Materials (TIMs) to improve prediction accuracy and streamline workflows.

## GE Aerospace

- 2018 Jul. **Summer Intern, Edison Engineering Development Program.**  
–Aug.
  - Contributed to aircraft tube redesign projects, integrating thermal and mechanical analysis to enhance performance and reduce costs.
  - Received training in proposing design modifications, and gained exposure to cross-disciplinary collaboration across thermal, structural, and manufacturing teams in aerospace component design.

## Shanghai Jiao Tong University

- 2016 Dec. **Research assistant.**  
–2019 Jun.
  - Designed and performed controlled high-T and high-P experiments in shock tube and rapid compression machine to study the ignition behavior of transportation fuels.
  - Conducted 0-D and 1-D simulations with CHEMKIN PRO and MATLAB to capture the transient evolution of temperature and composition which was not measured in experiments.
  - Performed parameterized studies in both simulation and experiments to assess how variations in environmental conditions (pressure, composition, and temperature) will impact system performance.
  - Developed a MATLAB-based mechanism reduction program implementing Directed Relation Graph (DRG) and DRG with Error Propagation (DRGEP) algorithms to simplify and accelerate ignition simulations.

## Cummins Fuel Systems (Wuhan)

- 2015 Feb. **Summer Intern, Product Engineering.**  
  - Assisted in product quality inspection of high-precision fuel injectors and pumps. Gained practical exposure to fuel injection system components.
  - Completed Six Sigma training for quality control and process improvement.

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## Education

- 2021–2025 : **PhD, Department of Physics, Lund University (LUND), Lund, Sweden.**  
Advisor: [Prof. Elna Heimdal Nilsson](#), [Prof. Xue-Song Bai](#)  
metal combustion, multiphase physics, thermal analysis, reaction kinetics, computational fluid dynamics (CFD), numerical simulation
- 2016–2019 : **Master of Engineering, School of Mechanical Engineering, Shanghai Jiao Tong University (SJTU), Shanghai, China.**  
Advisor: [Prof. Xingcai Lu](#)  
experiments and modeling of reactive flow systems, mechanism reduction, data analysis
- GPA : 3.84/4, top 5%

2012–2016 : **Bachelor of Engineering, New Energy Science & Technology**, *Huazhong University of Science & Technology (HUST)*, Wuhan, China.  
Advisor: [Prof. Xiaobei Cheng](#)  
thermodynamics, heat transfer, fluid mechanics, renewable energy systems (solar, wind, biomass, hydrogen, fuel cells)  
GPA : 91.09/100, top 5%

## Technical Skills

**System & Component Simulation:** Flotherm, ANSYS Fluent, OpenFOAM

**Design:** AutoCAD / Inventor, ProE

**Experiments:** climatic chamber, thermal conductivity measurements

**Programming & Automation:** C++, MATLAB, Python, SIMULINK (simulation workflows & data analysis)

**Multiphysics Modeling:** Cantera, CHEMKIN, Matlab-based solvers

## Teaching Assistantship

Fall, 2021–24 Quantum physics lab of Introduction to University Physics  
Spring, 22–24  
Fall, 2023 Spectroscopy lab for Atomic and Molecular Physics  
Spring, 2023 Vibration lab for Energy and Environmental Physics

## Honors & Awards

2025 Travel grant from the ***Styrelsen vid Lunds Tekniska Högskola (SLTH)***.  
2024 PhD student grant from the ***Royal Swedish Academy of Sciences***.  
2024 Travel grant from the ***ÅForsk Foundation***.  
2023 PhD student grant from the ***Royal Physiographic Society of Lund***.  
2021 Awarded the ***Best Popular Science Article*** in Communicating Science LTH.  
2018/2017 ***Zeyuan*** Scholarship, ***Don You Shuqi*** Scholarship in SJTU.  
2016 Outstanding Graduation Thesis of Hubei Province.  
2013/2014 National Scholarship.

## Conferences and Workshops

2025 Poster presentation in the 12th European Combustion Meeting, 2025, UK: *Numerical quantification of aluminum mass fraction profile around a steadily burning aluminum droplet with different gas-phase kinetics*.  
2025 3rd Metal-enabled Cycle of Renewable Energy (MECRE) Conference, Switzerland.  
2024 Oral presentation in the 40th International Symposium, Italy: *Detailed numerical simulation and experiments of a steadily burning micron-sized aluminum droplet in hot steam-dominated flows*.  
2024 Poster presentation in the 2nd Metal-enabled Cycle of Renewable Energy (MECRE) Conference, Germany: *A five-stage combustion model for single micron-sized iron particles*.  
2023 Poster presentation in the 11th European Combustion Meeting, France: *Modeling of single micron-sized aluminum particle burning in steam incorporating gas and surface reactions*.

- 2023 15th International Conference on Combustion Technologies for a Clean Environment, Portugal.
- 2022 Poster presentation in the 1st Metal-enabled Cycle of Renewable Energy (MECRE) Conference, Netherlands / Poster presentation in the 39th International Symposium on Combustion, Canada: *A five-stage combustion model for single micron-sized iron particles.*
- 2018 1st Clean Combustion Winter School King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

## Selected Publications

- 10 **Yue Qiu**, Xue-Song Bai, and Elna JK Nilsson. An updated kinetic mechanism for aluminum gas-phase combustion in oxygen and steam environments. ***Energy Conversion and Management: X.*** **accepted**, 2025.
- 9 **Yue Qiu**, Xue-Song Bai, and Elna JK Nilsson. A comprehensive review of aluminum gas-phase combustion kinetics in oxygen and steam environments. ***Applications in Energy and Combustion Science.*** **to be submitted**, 2025.
- 8 **Yue Qiu**. *Modeling of Metal Particle Combustion: Detailed Numerical Studies of Micron-sized Iron and Aluminum Particles*. Doctoral thesis (compilation), Combustion Physics, Lund University, 2025.
- 7 Can Ruan, Zhiyong Wu, **Yue Qiu**, Edouard Berrocal, Marcus Aldén, Xue-Song Bai, and Zhongshan Li. Quantitative measurement of aluminum atom number density around a burning micron-sized aluminum droplet using spatially resolved laser absorption spectroscopy. ***Combustion and Flame***, volume 279, page 114297, 2025.
- 6 Shijie Xu, **Yue Qiu**, Leilei Xu, Jianqing Huang, Shen Li, Elna JK Nilsson, Zhongshan Li, Weiwei Cai, Marcus Aldén, and Xue-Song Bai. Phase change and combustion of iron particles in premixed CH<sub>4</sub>/O<sub>2</sub>/N<sub>2</sub> flames. ***Combustion and Flame***, volume 259, page 113171, 2024.
- 5 **Yue Qiu**, Sheng Feng, Zhiyong Wu, Shijie Xu, Can Ruan, Xue-Song Bai, Elna JK Nilsson, Marcus Aldén, and Zhongshan Li. Detailed numerical simulation and experiments of a steadily burning micron-sized aluminum droplet in hot steam-dominated flows. ***Proceedings of the Combustion Institute***, volume 40, page 105717, 2024.
- 4 Sheng Feng, **Yue Qiu**, Shijie Xu, Zhiyong Wu, Can Ruan, Roth Adrian, Elna J. K. Nilsson, Edouard Berrocal, Zhongshan Li, Marcus Aldén, and Xue-Song Bai. Modeling of micron-sized aluminum particle combustion in hot gas flow. ***Fuel***, volume 369, page 131718, 2024.
- 3 **Yue Qiu**, Wei Zhou, Yuan Feng, Sixu Wang, Liang Yu, Zhiyong Wu, Yebing Mao, Yong Qian, and Xingcai Lu. An experimental and modeling study of autoignition characteristics of butanol/diesel blends over wide temperature ranges. ***Combustion and Flame***, volume 217, pages 175–187, 2020.
- 2 Liang Yu, **Yue Qiu**, Yebing Mao, Sixu Wang, Can Ruan, Wencao Tao, Yong Qian, and Xingcai Lu. A study on the low-to-intermediate temperature ignition delays of long chain branched paraffin: Iso-cetane. ***Proceedings of the Combustion Institute***, volume 37, pages 631–638, 2019.
- 1 **Yue Qiu**, Liang Yu, Leilei Xu, Yebing Mao, and Xingcai Lu. Workbench for the reduction of detailed chemical kinetic mechanisms based on directed relation graph and its deduced methods: Methodology and n-cetane as an example. ***Energy & Fuels***, volume 32, pages 7169–7178, 2018.