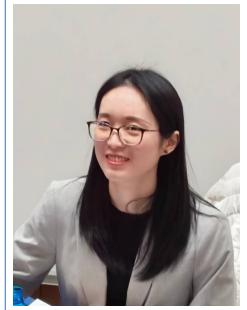


Yue Qiu

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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 combined experimental measurement and numerical validation to assess model 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 student, Department of Physics.**

2025 Aug. *MINICOR- "MILD Combustion with Nitrogen and Carbon Dioxide Reforming". Funded by European Innovation Council.*

- 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 student, Department of Physics.**

2025 Apr. *COCALD- "Towards CO₂-neutral energy Conversion using Advanced Laser Diagnostics and modeling". Funded by Knut and Alice Wallenberg Foundation.*

- 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.

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), turbulent models, 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 fuel ignition, 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 **Civilingenjören Hakon Hanssons Stiftelse**.

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.

2013-2015 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

- 16 Zhiyong Wu, Can Ruan, **Yue Qiu**, Mehdi Stiti, Shijie Xu, Niklas Jüngst, Edouard Berrocal, Marcus Aldén, Xue-Song Bai, and Zhongshan Li. Flame structure of single aluminum droplets burning in hot steam-dominated flows. ***Combustion and Flame***, volume 271, page 113838, 2025.
- 15 **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***, volume 28, page 101238, 2025.
- 14 **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.
- 13 **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.
- 12 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.
- 11 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 CH₄/O₂/N₂ flames. ***Combustion and Flame***, volume 259, page 113171, 2024.
- 10 **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.
- 9 Can Ruan, Zhiyong Wu, Mehdi Stiti, Markus Snellman, **Yue Qiu**, Arman Ahamed Subash, Edouard Berrocal, Marcus Aldén, and Zhongshan Li. Combustion of micron-sized Al-Mg alloy wires in hot H₂O/O₂/N₂ flows. ***Fuel***, volume 357, page 129719, 2024.
- 8 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.
- 7 **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.

- 6 Liang Yu, Sixu Wang, Wenyu Wang, **Yue Qiu**, Yong Qian, Yebing Mao, and Xingcai Lu. Exploration of chemical composition effects on the autoignition of two commercial diesels: Rapid compression machine experiments and model simulation. *Combustion and Flame*, volume 204, pages 204–219. **Elsevier**, 2019.
- 5 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.
- 4 Liang Yu, Yebing Mao, **Yue Qiu**, Sixu Wang, Hua Li, Wencao Tao, Yong Qian, and Xingcai Lu. Experimental and modeling study of the autoignition characteristics of commercial diesel under engine-relevant conditions. *Proceedings of the Combustion Institute*, volume 37, pages 4805–4812, 2019.
- 3 Liang Yu, Zhiyong Wu, **Yue Qiu**, Yong Qian, Yebing Mao, and Xingcai Lu. Ignition delay times of decalin over low-to-intermediate temperature ranges: Rapid compression machine measurement and modeling study. *Combustion and Flame*, volume 196, pages 160–173, 2018.
- 2 **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.
- 1 Yong Qian, **Yue Qiu**, Yahui Zhang, and Xingcai Lu. Effects of different aromatics blended with diesel on combustion and emission characteristics with a common rail diesel engine. *Applied Thermal Engineering*, volume 125, pages 1530–1538. **Elsevier**, 2017.