

## PERSONAL INFORMATION

### Weipeng YAO



📍 Le Plessis-Robinson

☎ +33 6 43 65 42 49

✉ [yao.weipeng@polytechnique.edu](mailto:yao.weipeng@polytechnique.edu)

🔗 <https://github.com/weipengyao>

Gender - Male | Date of birth - 22/05/1990 | Nationality - Chinese

## SUMMARY

Over 10 years of international research experience on laser, plasmas, and fusion energy. Strong expertise in data analysis, both from numerical simulations in high-performance computing (HPC) systems, and also experiments in high-power laser facilities. Good at collaboration and communication. Trilingual: Chinese (native), English (full professional), French (limited working).

## WORK EXPERIENCE

**2019 – Now** **Laboratoire pour l'Utilisation des Lasers Intenses (LULI), École Polytechnique**  
- open-source and collaborative plasma simulation codes, i.e., **SMILEI** and **EPOCH**;  
- use the world's most powerful HPC systems, i.e., **Niagara** (CA) and **TaihuLight** (CH);  
- use the world's most powerful laser facilities, i.e., **Apollon** (FR) and **Vulcan** (UK).  
**All of them involve heavy data analysis & visualization, see details in my papers.**

## SKILLS

### Data Analysis

Proficient	Python, L <sup>A</sup> T <sub>E</sub> X, Linux/Unix, HPC, Adobe illustrator, Fortran, Matlab
Master	Bash, C++, VisIt, ParaView, OpenMP/MPI, HDF5
Familiar with	Inkscape, machine learning (ML)

### Code Projects

2022 – 2023	ML algorithm for the unsupervised classification of particles' trajectories, a <b>M1 thesis</b> at LERMA, Sorbonne University, co-supervised with <b>Prof. Andrea Ciardi</b> , written in Python
2022 – Now	Open source, Particle-in-cell code with adaptive mesh refinement <b>PHARE</b> , written in C++
2019 – Now	Open source, fully kinetic, massively parallel, Particle-in-cell code <b>SMILEI</b> , written in C++
2019 – Now	Resistive magneto-hydrodynamic code <b>GORGON</b> , written in Fortran
2020 – 2021	Fully integrated particle physics Monte Carlo simulation package <b>FLUKA</b> , written in Fortran
2019 – 2020	The radiation hydrodynamic code <b>MULTI</b> , written in C++.
2012 – 2019	Open source, fully kinetic, massively parallel, Particle-in-cell code <b>EPOCH</b> , written in Fortran.

**Teaching** at Sorbonne University during academic year 2023-2024

Master 1	Numerical Tools in Physics
Master 2	<b>Numerical Methods</b>

## EDUCATION

2015 – 2019	Ph. D.: Plasma Physics, Peking University, Beijing, China ( <b>TOP 2</b> )
2012 – 2015	Master of Science: Plasma Physics, China Academy of Engineering Physics, Beijing, China
2008 – 2012	Bachelor of Science: Physics, Shanxi University, Taiyuan, China

## SCIENTIFIC TALKS

- 06/2023 the 6th International Conference on Matter and Radiation at Extremes (ICMRE2023), Zhuhai, China
- Invited Oral* *Dynamics of nanosecond laser pulse propagation and of associated instabilities in a magnetized underdense plasma*
- 05/2023 MRE Young Scientist Award 2023, Online
- Invited Oral* *Laboratory evidence of stochastic ion acceleration in laser-driven magnetized plasma*
- 12/2022 the 7th Workshop on Magnetic Fields in Laboratory High Energy Density Plasmas (LaB), Paris, France
- Invited Oral* *Laboratory stochastic particle acceleration in double-jet collision via magnetic Rayleigh-Taylor instability*
- 12/2022 Réunion Plénière du GDR U.P 2022, Paris, France
- Oral* *Optimizing laser coupling, matter heating, and particle acceleration from solids, using multiplexed ultraintense lasers*
- 07/2022 The 48th European Conference on plasma physics (EPS2022), Online
- Invited Oral* *Laboratory investigation on ion energization by the collision of magnetized collisionless shocks*
- 05/2022 MRE Young Scientist Award 2022, Online
- Invited Oral* *Nanosecond laser pulse propagation and laser-plasma instabilities in a magnetized, underdense plasma*
- 05/2022 The 13th International Conference on High Energy Density Laboratory Astrophysics (HEDLA2022), Lisbon, Portugal
- Invited Oral* *Laboratory evidence for proton energization by magnetized collisionless shocks*
- 08/2021 the 9th International Symposium "Modern Problems of Laser Physics" (MPLP-2021), Novosibirsk/Online, Russia
- Invited Oral* *Laboratory evidence for proton energization by collisionless shock surfing*
- 06/2021 the Satellite Meeting 2021 (EPS) of the 47th Conference on Plasma Physics, Online
- Oral* *Enhanced laser coupling, matter heating, and particle acceleration through Spatially-separated and Symmetrically-overlapped PW Lasers*
- 04/2021 INTERNATIONAL CONFERENCE ON HIGH ENERGY DENSITY SCIENCES 2021, Osaka Univ./Online, Japan
- Invited Oral* *Laboratory evidence for proton energization by collisionless shock surfing*
- 04/2021 the 4th international symposium on science and engineering (HPLSE2021), Suzhou, China
- Oral* *Laboratory evidence for proton energization by collisionless shock surfing*
- 03/2019 The symposium on laboratory astrophysics, Shenzhen, China
- Oral* *Kinetic study for the transport of astrophysical relativistic jet*
- 10/2018 The 4th International Conference on High Energy Density Physics, Ningbo, China
- Oral* *Kinetic PIC simulations for transport of astrophysical relativistic jet in ambient plasmas*
- 04/2018 The 2018 "Zhong Shenbiao" Academic Forum, Beijing, China
- Oral* *Kinetic effects of astrophysical relativistic flow transport in interstellar medium*
- 2017.10 The 2017 APS Division of Plasma Physics Meeting, Milwaukee, WI, USA
- Oral* *Achieving stable radiation pressure acceleration of heavy ions via successive electron replenishment from ionization of a high-Z material coating*
- 2016.4 The 2016 "Zhong Shenbiao" Academic Forum, Beijing, China
- Oral* *High quality proton beam generation by a combined mechanism using multi-component target*
- 2015.4 The 2015 High energy density physics young scientist forum, Beijing, China
- Oral* *High quality proton beam generation by a combined mechanism using multi-component target*
- 2014.9 The 2nd International Conference on High Energy Density Physics, Beijing, China
- Oral* *Generation of monoenergetic proton beams from a combined scheme with a CH target irradiated by ultraintense laser pulse*

For an up to date and exhaustive list of articles see my profile on [google scholar](#)

*Phys. Rev. Lett.* **130**, 265101 (2023) [Dynamics of nanosecond laser pulse propagation and of associated instabilities in a magnetized underdense plasma](#)

W. Yao, A. Higginson, J. -R. Marquès, P. Antici, J. Béard, K. Burdonov, M. Borghesi, A. Castan, A. Ciardi, B. Coleman, S. N. Chen, E. d'Humières, T. Gangolf, L. Gremillet, B. Khair, L. Lancia, P. Loiseau, X. Ribeyre, A. Soloviev, M. Starodubtsev, Q. Wang, J. Fuchs

*J. of Plasma Phys.* **89**, 915890101 (2023) [Investigating particle acceleration dynamics in interpenetrating magnetized collisionless super-critical shocks](#)

W. Yao, A. Fazzini, S. N. Chen, K. Burdonov, J. Béard, M. Borghesi, A. Ciardi, M. Miceli, S. Orlando, X. Ribeyre, E. d'Humières, J. Fuchs

*Matter Radiat. at Extremes* **7**, 026903 (2022) [Characterization of the stability and dynamics of a laser-produced plasma expanding across strong magnetic field](#)

W. Yao, J. Capitaine, B. Khair, T. Vinci, K. Burdonov, J. Béard, J. Fuchs, A. Ciardi

*Matter Radiat. at Extremes* **7**, 014402 (2022) [Detailed characterization of laboratory magnetized super-critical collisionless shock and of the associated proton energization](#)

W. Yao, A. Fazzini, S. N. Chen, K. Burdonov, P. Antici, J. Béard, S. Bolaños, A. Ciardi, R. Diab, E.D. Filippov, S. Kislov, V. Lelasseux, M. Miceli, Q. Moreno, V. Nastasa, S. Orlando, S. Pikuz, D. C. Popescu, G. Revet, X. Ribeyre, E. d'Humières, J. Fuchs

*Nature Physics* **17**, 1177–1182 (2021) [Laboratory evidence for proton energization by collisionless shock surfing](#)

W. Yao, A. Fazzini, S. N. Chen, K. Burdonov, P. Antici, J. Béard, S. Bolaños, A. Ciardi, R. Diab, E. D. Filippov, S. Kislov, V. Lelasseux, M. Miceli, Q. Moreno, V. Nastasa, S. Orlando, S. Pikuz, D. C. Popescu, G. Revet, X. Ribeyre, E. d'Humières, J. Fuchs

*Astrophysical J.* **876**, 2 (2019) [Kinetic Particle-in-cell Simulations of the Transport of Astrophysical Relativistic Jets in Magnetized Intergalactic Medium](#)

W. Yao, B. Qiao, Z. Zhao, Z. Lei, H. Zhang, C. T. Zhou, S. P. Zhu and X. T. He

*New J. Physics* **20**, 053060 (2018) [The baryon loading effect on relativistic astrophysical jet transport in the interstellar medium](#)

W. Yao, B. Qiao, Z. Xu, H. Zhang, H. X. Chang, Z. H. Zhao, C. T. Zhou, S. P. Zhu and X. T. He

*Phys. Plasmas* **24**, 082904(2017) [Relay transport of relativistic flows in extreme magnetic fields of stars](#)

W. Yao, B. Qiao, Z. Xu, H. Zhang, H. X. Chang, C. T. Zhou, S. P. Zhu, X. G. Wang and X. T. He

*Phys. Plasmas* **23**, 013107 (2016) [Optimization of the combined proton acceleration regime with a target composition scheme](#)

W. Yao, B. W. Li, C. Y. Zheng, Z. J. Liu, X. Q. Yan and B. Qiao

*Laser Part. Beams* **32**, 583-589 (2014) [Generation of monoenergetic proton beams by a combined scheme with an overdense hydrocarbon target and an underdense plasma gas irradiated by ultra-intense laser pulse](#)

W. Yao, B. W. Li, L. H. Cao, F. L. Zheng, T. W. Huang, C. Z. Xiao and M. M. Skoric