CURRICULUM VITAE – Silvio Sergio CERRI

Employment

2021–present	Laboratoire J.-L. Lagrange, Observatoire de la Côte d'Azur, CNRS, Nice, France Research Staff (Chargé de Recherche de Classe Normale) Group: *Turbulence Fluide et Plasmas*
2020–2021	Princeton University, Department of Astrophysical Sciences, USA Associate Research Scholar Group: *Astrophysical Plasmas* (with Prof. M. W. Kunz)
2017–2020	Princeton University, Department of Astrophysical Sciences, USA Postdoctoral Research Associate Group: *Astrophysical Plasmas* (with Prof. M. W. Kunz)
2016–2017	University of Pisa, Department of Physics, Italy Postdoctoral Researcher ("Assegnista di Ricerca") Group: *Space Plasmas* (with Prof. F. Califano)
2015–2016	Max-Planck-Institut für Plasmaphysik (IPP), Garching, Germany Transitional Postdoc Position (6 months) Group: *Turbulence in Laboratory and Astrophysical Plasmas* (with Prof. F. Jenko)
2012–2015	Max-Planck-Institut für Plasmaphysik (IPP), Garching, Germany Doctoral Researcher Group: *Turbulence in Laboratory and Astrophysical Plasmas* (with Prof. F. Jenko)

Education

Ulm University, Germany – Ph.D. in Physics *with highest honors* (*"magna cum laude"*), Dec 2015
Ph.D. Thesis: *Plasma Turbulence in the Dissipation Range – Theory and Simulations*
Advisor: Prof. Frank Jenko

University of Pisa, Italy – M.Sc. in Astrophysics *with highest honors* (*"110/110 cum laude"*), Mar 2012
Thesis: *Fluid Modeling of Kinetic Effects in Collisionless Magnetized Plasmas and Application to Solar Wind-Magnetosphere Interaction*
Advisor: Prof. Francesco Califano

University of Pisa, Italy – B.Sc. in Physics *with highest honors* (*"110/110 cum laude"*), Sep 2009
Thesis: *Physical features of the solar interior* (in Italian)
Advisor: Prof. Scilla Degl'Innocenti

Visiting Research Appointments

2024	Long-term vising fellow at Kavli Institute for Theoretical Physics (KITP), Santa Barbara, CA, USA 23 Jun – 20 Jul (program: *"Interconnections between the Physics of Plasmas and Self-gravitating Systems"*)
2022–24	Frequent short-term visitor at Gran Sasso Science Institute (GSSI), L'Aquila, Italy
2022–24	Frequent short-term visitor at Istituto Nazionale di Fisica Nucleare (INFN), Pisa, Italy
2019–20	Long-term visiting fellow at Observatoire de la Côte d'Azur (OCA), Nice, France 1–30 Nov 2019; 23 Nov – 22 Dec 2020 [canceled due to Covid-19]

Grants, Awards, and Qualifications

2023	PI of MiCRO ("Micro-physics of Cosmic-Ray Observables"), a 4-year research project (2023-2027) funded by the French National Research Agency (grant amount: 280.000 €)
2023-34	Qualification as Associate University Professor from the Italian Ministry of University and Research: [*"Abilitazione Scientifica Nazionale come Professore di seconda fascia da parte del MIUR"*] • 02/B2: Theoretical Physics of Matter (*"Fisica Teorica della Materia"*) • 02/C1: Astrophysics (*"Astronomia, Astrofisica, Fisica della Terra e dei Pianeti"*)
2015	Prize "Vincenzo Ferraro" in Space Plasma Physics
2012–15	International Helmholtz Graduate School for Plasma Physics (HEPP) Fellow c/o IPP Garching

Service

Co-organizer of the workshop *"Physique des plasmas dans l'Univers à haute énergie"* (website)

Organizer of the workshops *"Cosmic Rays á l'Observatoire de la Côte d'Azur"* (CROCA): 2022, 2023 (website)

Organizer of the *"Lagrange Seminars"* at the Observatoire de la Côte d'Azur [Nov 2021 – Sep 2023]

Organizer of the *"Astroplasmas Seminars"* at the Department of Astrophysical Sciences, Princeton University [Jun 2020 – Aug 2021; see also astroplasmas.com]

Member of LOC for *1st JPP Frontiers in Plasma Physics Conference*, Spineto, Italy (2017)

Member of LOC for *Space Plasmas Working Meeting*, Pisa, Italy (2017)

Member of SOC for *HEPP session* at Annual DPG Meeting, Berlin, Germany (2014)

Referee for *Physical Review Letters*, *The Astrophysical Journal*, *Astronomy & Astrophysics*, *Physics of Plasmas*, *Journal of Plasma Physics*, *New Journal of Physics*, *The European Physical Journal Plus*, *Frontiers in Physics*, *Frontiers in Astronomy and Space Sciences*, *Springer Book Series*

Competitively Obtained HPC Time

[2022/23] **DARI** (grant n.A0130413794): PI, 7.1M CPU-hrs on Joliot Curie/Irene SKL for the project *"At the bottom of the Alfvénic cascade: wave-mode interactions and magnetic reconnection in the kinetic range"*

[2018/19] **PRACE** (grant n.2017174107): Co-PI, 60M CPU-hrs on Marconi-KNL for *Eulerian and lagrangian plasma simulations of kinetic turbulence* (*NOTICE*: I could not be PI because I am not affiliated with an European institution, but I defined the scientific objectives and most of technical details of the project)

[2016/17] **ISCRA** (grant n.HP10BEANCY): Co-PI, 20M CPU-hrs on Marconi-KNL for *Kinetic turbulence in collisionless plasma* (*NOTICE*: I was not designed as PI of this large-size allocation for career-stage reasons, but I entirely defined the scientific objectives and technical details of the project)

[2016/17] **ISCRA** (grant n.HP10C04BTP): PI, 4M CPU-hrs on GALILEO for *Response to an external forcing in hybrid-kinetic plasma turbulence*

[2012/13] **HPC Student Award:** PI, 320k CPU-hrs on FERMI for *Profiling and optimization of a 3D code for anisotropic two-fluid models*

[2019/20] **ISCRA** (grant n.HP10B10ALD): Co-I, 9M CPU-hrs on Marconi-KNL for *Magnetic reconnection: a multi-model analysis*

[2017/18] **NASA-HEC**: Co-I, 1M SBUs on PLEIADES for *Kinetic Turbulence and Ion Heating in the Solar Wind*

[2016/17] **LRZ-HPC** (grant n.PR74VI): Co-I, 30M CPU-hrs on SuperMUC for *Kinetic simulations of astrophysical and solar plasma turbulence*

[2012/13] **ISCRA** (grant n.HP10AT2EHV): Co-I, 16M CPU-hrs on FERMI for *Multiscale Plasma Simulations*

[2011/12] **ISCRA** (grant n.HP10AONY05): Co-I, 10M CPU-hrs on FERMI for *Nonlinear 3D dynamics of magnetized plasmas driven by shear flows*

Public Codes

DRAGON: **D**iffusion **R**eacceleration & **A**dvection of **G**alactic cosmic rays: **O**pen **N**ew code (Version 2-Beta); Project webpage: The DRAGON Project.

DRAGONCELLO: cosmic-ray transport including a fully anisotropic diffusion tensor (Version 1.0); see: Cerri et al., JCAP 10:019 (2017). Repository: github.com/sscerr/DRAGONCELLO.

eTF: parallel (MPI) solver of the "extended Two-Fluid" plasma model equations (Version 1.0); see: Cerri et al., Phys. Plasmas 20, 112112 (2013). Repository: github.com/sscerr/eTF.

Selected Publications

(*full list: NASA-ADS*)

1. **Cerri S. S.**, Passot T., Laveder D., Sulem P.-L., Kunz M. W., *Turbulent Regimes in Collisions of 3D Alfvén-wave Packets*, Astrophys. J. **939**, 36 (2022).
2. **Cerri S. S.**, Arzamasskiy L., Kunz M. W., *On Stochastic Heating and Its Phase-space Signatures in Low-β Kinetic Turbulence*, Astrophys. J. **916**, 120 (2021).
3. **Cerri S. S.**, Grošelj D., Franci L., *Kinetic plasma turbulence: recent insights and open questions from 3D3V simulations*, Front. Astron. Space Sci. **6**, 64 (2019). *(Invited "Perspective" Article)*
4. **Cerri S. S.**, Califano F., *Reconnection and small-scale fields in 2D-3V hybrid-kinetic driven turbulence simulations*, New J. Phys. **19**, 025007 (2017). *("Highlights of 2017" by NJP)*
5. **Cerri S. S.**, Gaggero D., Vittino A., Evoli C., Grasso D., *A signature of anisotropic cosmic-ray transport in the gamma-ray sky*, J. Cosmol. Astropart. Phys. **10**, 019 (2017).

Selected Talks

Jun 2024	Workshop "Plasma Physics in the High-Energy Universe", Toulouse, France **(Invited)** *Plasma turbulence and cosmic-ray transport*
May 2024	Transalpine workshop on magnetic reconnection and turbulence in space and fusion plasmas, Nice, France **(invited)** *A role for magnetic reconnection in anisotropic plasma turbulence*
Apr 2024	Workshop "Synergistic approaches to particle transport in magnetized turbulence: from the laboratory to astrophysics", PCTS, Princeton University, USA *Revisiting the turbulent damping of cosmic-ray driven Alfvén waves*
Dec 2023	AGU Fall Meeting, San Francisco, CA, USA **(Invited)** *Turbulent regimes from interactions of 3D Alfvén-wave/kinetic-Alfvén-wave packets* (remote)
Aug 2023	Turbulent Energy Transfer in Space Plasmas workshop, Lyon, France **(Invited)** *Sub-ion-scale turbulence and ion heating: recent results from 3D hybrid-kinetic simulations*
Jul 2023	IUGG General Assembly - IAGA Symposium, Berlin, Germany **(Invited)** *Recent advances from hybrid-kinetic simulations of sub-ion-scale turbulence and ion heating*
Jul 2023	CFRCOS4: 4th workshop of the cosmic-ray French community, Montpellier, France **(Invited)** *Micro-physics of cosmic-ray transport: the MiCRO project*
Jun 2023	SERPENTINE Symposium, Toulouse, France **(Invited)** *Cosmic-ray transport (in the Galaxy): a micro-physics perspective* (remote)
Jun 2022	Journées SF2A, Besançon, France **(Invited)** *Turbulent regimes in collisions of 3D Alfvén-wave packets*
Dec 2020	AGU Fall Meeting [moved to e-conference because of COVID-19] **(Invited)** *Small-scale turbulence and energy conversion in kinetic plasmas*
Oct 2020	AAPPS-DPP, 4$^{\text{th}}$ Asia-Pacific Conference on Plasma Physics **(Invited, Topical Plenary)** *Kinetic turbulence and ion heating in the solar wind*
Jan 2020	Max-Planck/Princeton Center (MPPC) Workshop, Göttingen, Germany **(Invited)** *Ion heating in low-β kinetic plasma turbulence*
Jul 2019	6$^{\text{th}}$ Vlasovia Conference, Strasbourg, France **(Invited)** *Reconnection and ion heating in low-β plasma turbulence*
Jun 2019	Waves Côte d'Azur, Nice, France **(Invited)** *The good, the bad and the ugly: kinetic plasma turbulence in a 3D3V phase space*
Jul 2018	11$^{\text{th}}$ Plasma Kinetics Working Meeting, Wolfgang Pauli Institute, Vienna, Austria **(Invited)** *3D hybrid-kinetic turbulence and phase-space cascades in a $\beta = 1$ plasma*
Apr 2018	Max-Planck/Princeton Center (MPPC) Workshop, Princeton University, USA **(Invited)** *3D hybrid-Vlasov–Maxwell turbulence: reconnection, spectral anisotropy, phase-space cascades*
May 2017	1$^{\text{st}}$ JPP Frontiers in Plasma Physics Conference, Spineto, Italy **(Invited)** *Magnetic reconnection as primary driver of the turbulent cascade below the ion gyroradius: hybrid-kinetic simulations*
Jan 2016	Max-Planck/Princeton Center (MPPC) General Meeting, Berlin, Germany **(Invited)** *Subproton-scale cascades in driven hybrid-kinetic plasma turbulence*

Teaching Experience

Falls 2022–2023	Guest Lecturer, Dept. of Physics, University of Pisa · "Fisica dei Plasmi" ("Physics of Plasmas"; ∼ 15 students)
Fall 2018	Guest Lecturer, Dept. of Physics, University of Pisa · "Fondamenti di Fisica dei Plasmi e dei Fluidi" ("Principles of fluid and plasma physics"; ∼ 20 students)
Springs 2016–2017	Guest Lecturer, Dept. of Physics, University of Pisa · "Plasmi B" ("Kinetic Plasma Theory"; ∼ 15 students)
Falls 2014–2016	Guest Lecturer, Dept. of Physics, University of Pisa · "Plasmi A" ("Fluid Plasma Theory"; ∼ 15 students)
Springs 2013–2014	Teaching/Laboratory Assistant c/o IPP Garching · "Plasmaphysikpraktikum" (plasma physics lab; 4 students)

Mentoring and Supervision

M.Sc. Thesis:	S. De Camillis (U. Pisa; 2013), E. Lazzeretti (U. Pisa; 2016), A. Moirano (U. Pisa; 2018)
Ph.D. Thesis:	F. Finelli (co-supervision with F. Califano, U. of Pisa; 2022)
Postdoc:	E. Puzzoni (start: Nov 2024, ANR-MiCRO postdoc, 2+1 years)

Outreach

2017	*"The turbulent world of plasmas: from astrophysics to fusion reactors"*, Kuriltai 2017, Pisa, Italy
2015	*"Plasmas and the Universe"*, Toastmaster International, Santa Monica Club 21, Los Angeles, USA
2013	*"The interaction between the solar wind and the Earth's magnetosphere"*, Kuriltai 2013, Trento, Italy
2010	Guide for the public exhibition *"La natura si fa in 4"*, an exhibition for mid- and high-school students on the four forces of nature, Pisa, Italy (organized by the National Institute of Nuclear Physics)
2010–11	Guide for the public exhibition *"La notte dei ricercatori"*, a guided tour through the history, research, and experiments developed within the Department of Physics at the University of Pisa
2009	Guide for the *"Ludoteca Scientifica"*, an exhibition and laboratory of basic physics experiments for students ranging from mid to high schools (11–18 years-old range)

Involvement in International Collaborations

2022–present	Coordinator of the *MICRO initiative* ("MIcro-physics of Cosmic-Ray Observables")
2020–present	Member of several ESA Solar Orbiter working groups (Turbulence WG, Kinetic Physics WG1 WG2, Reconnection WG, Multiscale Physics WG)
2014–2018	Member of the numerical support team for ESA THOR mission proposal (M4 class)
2013–2021	Member of Max-Planck/Princeton Center for Plasma Physics (MPPC)
2011–2014	Member of the Space Weather Integrated Forecasting Framework (SWIFF) team (FP7 project)

References

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