

CURRICULUM VITAE – Silvio Sergio CERRI

Employment

- 2021–present Laboratoire J.-L. Lagrange, Observatoire de la Côte d’Azur, CNRS, Nice, France
Research Staff (CRCN: 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 visiting 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 €)
- 2023–35 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

Organizer of the workshops “*Cosmic Rays á l’Observatoire de la Côte d’Azur*” (CROCA): 2022, 2023, 2026

Co-organizer of the workshop “*Kinetics of Collisionless and Collisional Systems (KICCS): bridging the gap between physicist and mathematicians*” [website pwd: [su0tivan](#)]

Co-organizer of the workshops “*Kinetic Physics of Astrophysical Plasmas*” (KPAP): 2025, 2026

Co-organizer of the workshop “*Physique des plasmas dans l’Univers à haute énergie*”

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)

Editor for *The European Physical Journal Plus*

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

[2025/26] **DARI** (grant n.A0180416202): co-PI, 20M CPU-hrs on Joliot Curie/Irene Rome. Project: “*Modeling cosmic-ray transport in the Galaxy: high-resolution simulations of MHD turbulence with the PLUTO code*”

[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., *Revisiting the role of cosmic-ray driven Alfvén waves in pre-existing magnetohydrodynamic turbulence. I. Turbulent damping rates and feedback on background fluctuations*, Astron. Astrophys. **688**, A182 (2024).
2. 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).
3. 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).
4. 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)
5. 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)
6. 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 2026 | European Physical Society (EPS) Plasma Physics Conference, Edinburgh, UK (Invited)
<i>Kinetic plasma turbulence: recent insights on sub-ion-scale cascades, magnetic reconnection, and ion heating</i> |
| Oct 2025 | DRAGON School: cosmic-ray theory, phenomenology, and beyond, Madrid, Spain (Lecture)
<i>Plasma Turbulence & Cosmic-ray Transport</i> |
| Jul 2024 | KITP program “Interconnections between the Physics of Plasmas and Self-gravitating Systems”, Santa Barbara, CA, USA (Invited)
<i>Phase-space cascades in (simulations of) plasma turbulence</i> |
| Apr 2024 | Workshop “Synergistic approaches to particle transport in magnetized turbulence: from the laboratory to astrophysics”, PCTS, Princeton University, USA
<i>Revisiting the turbulent damping of cosmic-ray driven Alfvén waves</i> |
| Dec 2023 | AGU Fall Meeting, San Francisco, CA, USA (Invited)
<i>Turbulent regimes from interactions of 3D Alfvén-wave/kinetic-Alfvén-wave packets</i> (remote) |
| Jul 2023 | IUGG General Assembly - IAGA Symposium, Berlin, Germany (Invited)
<i>Recent advances from hybrid-kinetic simulations of sub-ion-scale turbulence and ion heating</i> |
| Jul 2023 | CFRCOS4: 4th workshop of the cosmic-ray French community, Montpellier, France (Invited)
<i>Micro-physics of cosmic-ray transport: the MiCRO project</i> |
| Jun 2022 | Journées SF2A, Besançon, France (Invited)
<i>Turbulent regimes in collisions of 3D Alfvén-wave packets</i> |
| Dec 2020 | AGU Fall Meeting [moved to e-conference because of COVID-19] (Invited)
<i>Small-scale turbulence and energy conversion in kinetic plasmas</i> |
| Oct 2020 | AAPPS-DPP, 4 th Asia-Pacific Conference on Plasma Physics (Invited, Topical Plenary)
<i>Kinetic turbulence and ion heating in the solar wind</i> |
| Jan 2020 | Max-Planck/Princeton Center (MPPC) Workshop, Göttingen, Germany (Invited)
<i>Ion heating in low-β kinetic plasma turbulence</i> |
| Jul 2019 | 6 th Vlasovia Conference, Strasbourg, France (Invited)
<i>Reconnection and ion heating in low-β plasma turbulence</i> |
| Jun 2019 | Waves Côte d’Azur, Nice, France (Invited)
<i>The good, the bad and the ugly: kinetic plasma turbulence in a 3D3V phase space</i> |
| Apr 2018 | Max-Planck/Princeton Center (MPPC) Workshop, Princeton University, USA (Invited)
<i>3D hybrid-Vlasov-Maxwell turbulence: reconnection, spectral anisotropy, phase-space cascades</i> |
| May 2017 | 1 st JPP Frontiers in Plasma Physics Conference, Spineto, Italy (Invited)
<i>Magnetic reconnection as primary driver of the turbulent cascade below the ion gyroradius: hybrid-kinetic simulations</i> |
| Jan 2016 | Max-Planck/Princeton Center (MPPC) General Meeting, Berlin, Germany (Invited)
<i>Subproton-scale cascades in driven hybrid-kinetic plasma turbulence</i> |

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 (Pisa, 2013), E. Lazzeretti (Pisa, 2016), A. Moirano (Pisa, 2018)
 Ph.D. Thesis: A. Firinu (with T. Passot; Nice, 2026-), F. Finelli (with F. Califano; Pisa, 2019-2022)
 Postdoc: E. Puzzoni (ANR-MiCRO postdoc; Nice, 2024-)

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

DR. THIERRY PASSOT
CNRS, Laboratoire J.-L. Lagrange, Observatoire de la Côte d’Azur
thierry.passot@oca.eu

PROF. MATTHEW W. KUNZ
Department of Astrophysical Science, Princeton University
kunz@astro.princeton.edu

PROF. FRANCESCO CALIFANO
Department of Physics “E. Fermi”, University of Pisa
francesco.califano@unipi.it

PROF. FRANK JENKO
Head of Tokamak Theory Division, Max-Planck-Institute for Plasma Physics
frank.jenko@ipp.mpg.de