

PERSONAL INFORMATION

Andrea Mignone

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Gender Male | Date of birth 24 February 1973

WORK EXPERIENCE

Dec 2016 – Present

Associate Professor

Physics Department - University of Turin
Via Pietro Giuria 1, 10125 Torino (Italy)

Teaching activities:

- 2019 – now Teacher in: *Introduction to Parallel Programming using MPI* (Ph.D. level)
- 2014 – now Teacher in: *Numerical Algorithms for Physics* (Master level)
- 2014 – now Teacher / Assistant in *General Physics with laboratory* (Bachelor level)
- 2013 – now Teacher in: *Physics of Matter in the Fluid and Plasma State* (Master level)
- 2008 – 2013 Teacher in: *Physics I* (Math Department, Bachelor level)
- 2008 – 2011 Assistant in: *Classical Mechanics* (Bachelor level)
- 2005 – 2006 Lecturer in: *Computational Astrophysics* (Ph.D. level)
- 2001 Assistant in: *Basic Astronomy* (Bachelor level, The University of Chicago)

From 2015 I am also a member of the Ph.D. Teaching Staff at the physics department, Turin University.

Research activities: My active field of research is plasma physics and computational modelling of astrophysical magnetized flows using classical and relativistic magnetohydrodynamics numerical simulations. My primary scientific applications target the dynamics, morphologies and instabilities of jets from active galactic nuclei (AGN), pulsar wind nebulae as well as stellar jets. Other fields investigation include angular momentum transfer in disks and, more recently, gas-particle hybrid numerical models with applications to magnetic reconnection physics as well as dust physics in proto-planetary disk.

At the same time I am leading the development, maintenance and distribution of the PLUTO code for astrophysical gas dynamics (<http://plutocode.ph.unito.it>), now among the top five publicly available codes in the community and receiving over 600 downloads per year from several institutions around the world. PLUTO is being employed for state of the art research involving fluid-dynamics numerical simulations and achieving results in top-ranked peer-reviewed journals.

2008 – 2016 **Permanent Researcher**
Physics Department - University of Turin
Via Pietro Giuria 1, 10125 Torino (Italy)
As a permanent researcher, my research interested have been committed to three major field

1. development of numerical methods for classical and relativistic magneto-hydrodynamics in the PLUTO code,
2. dynamics and stability of relativistic extragalactic jets;
3. dynamics, propagation and spectral signature from Herbig-Haro objects;
4. angular momentum transport in accretion disks.

I have co-supervised 5 master thesis students and lead, through the last 7 years, 4 post-docs of different nationalities to pursue my group research objectives (7 peer-reviewed papers with a total of 101 citations). At the same time, I have undertaken more than 10 collaborations with national and international research groups for which my expertise and contribution to the numerical modeling of specific astrophysical problems was required.

2007 – 2008 **Postdoctoral Fellowship**
Turin Astronphysical Observatory
During my post-doctoral fellowships I focused my research into the subject of stellar jets by investigating both dynamical propagation and radiative processes using advanced computational modeling. During this time, I played a major role in leading a team of Ph.D. students part of the JETSET Research Training Network at UniTo. Our team achievements had a noticeable impact in the international community of stellar jets and disk/jet launching with 9 peer-reviewed articles for a total of 133 citations.

2005 – 2007 **Postdoctoral Fellowship**
Physics Department, University of Turin
Computer-aided simulation models of stellar jets with application to young stellar objects.

2004 – 2005 **Postdoctoral Fellowship**
Turin Astronphysical Observatory
Initial stage development of the PLUTO code and computational model of relativistic magnetized jets.

RESEARCH GRANTS & RESPONSIBILITIES

2017-2019 **PRIN MIUR 2015**
Grant awarded as PI by MIUR (Ministero dell'Istruzione, dell'Università e della Ricerca), Project title: *"Multi-scale Simulations of High-Energy Astrophysical Plasmas"* - Amount = €254,584.
URL: [http://attiministeriali.miur.it/anno-2016/novembre/dd-07112016-\(1\).aspx](http://attiministeriali.miur.it/anno-2016/novembre/dd-07112016-(1).aspx) [Allegato 2].

2011-2013 **PRIN INAF 2010**
Responsible as coordinator of the 2nd research unit for the awarded INAF grant, PI: G. Bodo, Project title: *"Turbulence and Angular Momentum Transport in Accretion Discs"* - Amount = €38,000.

2009-2012 **PRIN INAF 2008**
Responsible as coordinator of the 2nd research unit for the awarded INAF grant (...), PI: G. Bodo, Project title: *"Large scale numerical simulations of magnetized relativistic flows"* - Amount = €69,948.

2010-2020 **Awarded Computational time at CINECA**

Responsible as PI for several computational resources granted on Cineca HPC systems. Projects and awarded CPU hours, relative to the last 6 years, are listed below:

- "Numerical Convergence of Magnetic Reconnection in Relativistic Plasma". Award: 330,000 CPU hrs (Active);
- "Synthetic Maps from Low-Power FRI Jets". Award: 450,000 CPU hrs (May 2019-May 2020);
- "CR Acceleration in Shear Layer". Award: 237.500 CPU hrs (Feb 2018-Feb 2019);
- "Large Scale Reconnection in 3D Relativistic Jets". Award: 62,500 CPU hrs (Dec 2016-Dec 2017);
- "Three Dimensional Reconnection in Jets". Award; 5,700,000 CPU hrs (Oct 2015-Dec 2016);
- "Current-Driven Instabilities in Three Dimensional Relativistic Jets". Award 140,000 CPU hrs (Dec 2010-Feb 2012);
- "Nonlinear evolution of current-carrying relativistic jet". Award: 4,500,000 CPU hrs (Mar 2013-Mar 2014);
- "Pressure-Balanced and Force-Free Magnetized Jets". Award: 4,950,000 CPU hrs (Dec 2014-Dec 2015).

Reviewer Activity

2008-Today I've contributed as referee to the peer-review process for the following (major) journals:

- Astrophysical Journal (ApJ) & Astrophysical Journal Supplement (ApJS);
- Astronomy & Astrophysic (AA);
- Monthly Notices of the Royal Astronomical Society (MNRAS);
- Journal of Computational Physics (JCP);
- New Astronomy;
- IEEE Transactions on Plasma Science;
- Computer Physics Communications

Participation to networks / Collaboration

2005-Today some text here

- 2005-2008 Participation to the JETSET (Jet Simulations, Experiments and Theory) Marie Curie Research Training Network, oriented to protostellar jets and plasma physics. Co-supervision of Ph.D. students Ovidiu Tesileanu (Nov 2005-Nov 2008) and Titos Matsakos (Dec 2005 - Oct 2008).
- 2008-2015 Participation - as expert in plasma physics and numerical techniques - to the Center for Magnetic Self Organization in Astrophysical and Laboratory Plasmas (CMSO), The University of Chicago URL: <https://astro.uchicago.edu/research/cmso.php>
- 2010-Today Collaboration with the *Computational Research Division, Lawrence Berkeley National Laboratory (USA)* (P. Colella, B. Van Straalen) aimed to the implementation of the CHOMBO library for adaptive mesh refinement in the PLUTO code, (<https://ui.adsabs.harvard.edu/abs/2012ApJS..198....7M/abstract>)
- 2011-2015 Participation (as expert in MHD instabilities and numerical simulations) to the *Plasma Astrophysics Laboratory (PAL)* project (PI: Bruno Coppi).

EDUCATION AND TRAINING

Mar 2001 – Dec 2004 **Ph.D. in Astrophysics**

FLASH Center, The University of Chicago (Chicago), USA

Thesis title: "The Dynamics of Radiative Shock Waves", Advisor: R. Rosner

Sep 1999 – Mar 2001 **M.S. in Astrophysics**

Dept. of Astronomy & Astrophysics, The University of Chicago (Chicago), USA

Jan 1999 **Master Thesis in Physics**

Physics Department, University of Turin, 10125 Torino (Italy)

Grade: 110/110 *cum laude*

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
Common European Framework of Reference (CEF) level

Computer skills Advanced expertise with major operating systems (UNIX/Linux, Mac OS, Windows). Knowledge of the following programming / scripting languages:

- Fortran (Intermediate)
- C / C++ (Advanced)
- IDL (Advanced)
- Python (Intermediate)
- General bash programming (Low-Intermediate)
- MAPLE, Matlab, Vist, Gnuplot (Basic)

Driving licence B

Publications

I presently have more than 130 publications, 100 of which as peer-reviewed articles in major international journals for a total number of 3,100 citations (source: NASA ADS database). Here I list the publications over the last 5 years:

- 2021 P. Dominguez-Fernandez, M. Bruggen, F. Vazza, W. E. Banda-Barragan, K. Rajpurohit, A. Mignone, D. Mukherjee, and B. Vaidya. Morphology of radio relics - I. What causes the substructure of synchrotron emission? *MNRAS*, 500:795–816, January 2021
- 2021 A. Mignone and L. Del Zanna. Systematic construction of upwind constrained transport schemes for MHD. *Journal of Computational Physics*, 424:109748, January 2021
- 2020 Dipanjan Mukherjee, Gianluigi Bodo, Andrea Mignone, Paola Rossi, and Bhargav Vaidya. Simulating the dynamics and non-thermal emission of relativistic magnetized jets I. Dynamics. *MNRAS*, 499(1):681–701, September 2020
- 2020 A. Mignone, B. Vaidya, E. Puzzone, D. Mukherjee, G. Bodo, and M. Flock. Particle-Gas Hybrid Schemes in the PLUTO Code. In *Journal of Physics Conference Series*, volume 1623 of *Journal of Physics Conference Series*, page 012007, September 2020
- 2020 Rolf Kuiper, Harold W. Yorke, and Andrea Mignone. Makemake + Sedna: A Continuum Radiation Transport and Photoionization Framework for Astrophysical Newtonian Fluid Dynamics. *ApJS*, 250(1):13, September 2020
- 2020 Z. Ahmane, A. Mignone, C. Zanni, S. Massaglia, and A. Bouldjderi. Simulations of protostar-driven photoionization in Herbig-Haro jets. *Ap&SS*, 365(6):94, June 2020
- 2019 A. Mignone, M. Flock, and B. Vaidya. A Particle Module for the PLUTO Code. III. Dust. *ApJS*, 244(2):38, October 2019
- 2019 A. Mignone, G. Mattia, G. Bodo, and L. Del Zanna. A constrained transport method for the solution of the resistive relativistic MHD equations. *MNRAS*, 486(3):4252–4274, Jul 2019
- 2019 Julio David Melon Fuksman and Andrea Mignone. A Radiative Transfer Module for Relativistic Magnetohydrodynamics in the PLUTO Code. *ApJS*, 242(2):20, Jun 2019
- 2019 G. Bodo, G. Mamatsashvili, P. Rossi, and A. Mignone. Linear stability analysis of magnetized relativistic rotating jets. *MNRAS*, 485(2):2909–2921, May 2019
- 2019 G. Bodo, F. Cattaneo, A. Mignone, and P. Rossi. Magnetorotational Turbulence, Dynamo Action and Transport in Convective Disks. *Astrophysics and Space Science Proceedings*, 55:3, Jan 2019
- 2019 S. Massaglia, G. Bodo, P. Rossi, S. Capetti, and A. Mignone. Making Faranoff-Riley I radio sources. II. The effects of jet magnetization. *A&A*, 621:A132, Jan 2019
- 2018 Bhargav Vaidya, Andrea Mignone, Gianluigi Bodo, Paola Rossi, and Silvano Massaglia. A Particle Module for the PLUTO Code. II. Hybrid Framework for Modeling Nonthermal Emission from Relativistic Magnetized Flows. *ApJ*, 865(2):144, Oct 2018
- 2018 A. Mignone, G. Mattia, and G. Bodo. Linear wave propagation for resistive relativistic magnetohydrodynamics. *Physics of Plasmas*, 25(9):092114, Sep 2018
- 2018 A. Mignone, G. Bodo, B. Vaidya, and G. Mattia. A Particle Module for the PLUTO Code. I. An Implementation of the MHD-PIC Equations. *ApJ*, 859(1):13, May 2018
- 2017 Bhargav Vaidya, Deovrat Prasad, Andrea Mignone, Prateek Sharma, and Luca Rickler. Scalable explicit implementation of anisotropic diffusion with Runge-Kutta-Legendre super-time stepping. *MNRAS*, 472(3):3147–3160, Dec 2017
- 2017 Valentí Bosch-Ramon, Maxim V. Barkov, Andrea Mignone, and Pol Bordas. HESS J0632+057: hydrodynamics and non-thermal emission. *MNRAS*, 471(1):L150–L154, Oct 2017

Publications

- 2017 Gherardo Romanelli, Andrea Mignone, and Angelo Cervone. Pulsed fusion space propulsion: Computational Magneto-Hydro Dynamics of a multi-coil parabolic reaction chamber. *Acta Astronautica*, 139:528–544, Oct 2017
- 2017 G. Bodo, F. Cattaneo, A. Mignone, and P. Rossi. Magnetic Helicities and Dynamo Action in Magneto-rotational Turbulence. *ApJ*, 843(2):86, Jul 2017
- 2017 D. Wójcik, K. Murawski, Z. E. Musielak, P. Konkol, and A. Mignone. Numerical Simulations of Torsional Alfvén Waves in Axisymmetric Solar Magnetic Flux Tubes. *Sol. Phys.*, 292(2):31, Feb 2017
- 2017 D. M. A. Meyer, A. Mignone, R. Kuiper, A. C. Raga, and W. Kley. Bow shock nebulae of hot massive stars in a magnetized medium. *MNRAS*, 464(3):3229–3248, Jan 2017
- 2017 A. Mignone. MHD Modeling: Aims, Usage, Scales Assessed, Caveats, Codes. In Diego F. Torres, editor, *Modelling Pulsar Wind Nebulae*, volume 446, page 187, Jan 2017
- 2017 B. Kuźma, K. Murawski, T. V. Zaqarashvili, P. Konkol, and A. Mignone. Numerical simulations of solar spicules: Adiabatic and non-adiabatic studies. *A&A*, 597:A133, Jan 2017
- 2016 B. Olmi, L. Del Zanna, E. Amato, N. Bucciantini, and A. Mignone. Multi-D magnetohydrodynamic modelling of pulsar wind nebulae: recent progress and open questions. *Journal of Plasma Physics*, 82(6):635820601, Dec 2016
- 2016 G. Bodo, G. Mamatsashvili, P. Rossi, and A. Mignone. Linear stability analysis of magnetized jets: the rotating case. *MNRAS*, 462(3):3031–3052, Nov 2016
- 2016 E. Striani, A. Mignone, B. Vaidya, G. Bodo, and A. Ferrari. MHD simulations of three-dimensional resistive reconnection in a cylindrical plasma column. *MNRAS*, 462(3):2970–2979, Nov 2016
- 2016 S. Massaglia, G. Bodo, P. Rossi, S. Capetti, and A. Mignone. Making Faranoff-Riley I radio sources. I. Numerical hydrodynamic 3D simulations of low-power jets. *A&A*, 596:A12, Nov 2016
- 2016 F. Reale, S. Orlando, M. Guarrasi, A. Mignone, G. Peres, A. W. Hood, and E. R. Priest. 3D MHD modeling of twisted coronal loops. *ApJ*, 830(1):21, Oct 2016

- 2015 G. Bodo, F. Cattaneo, A. Mignone, F. Ponso, and P. Rossi. Global Properties of Fully Convective Accretion Disks from Local Simulations. *ApJ*, 808(2):141, Aug 2015
- 2015 B. Vaidya, A. Mignone, G. Bodo, and S. Massaglia. Astrophysical fluid simulations of thermally ideal gases with non-constant adiabatic index: numerical implementation. *A&A*, 580:A110, Aug 2015
- 2015 M. Salz, R. Banerjee, A. Mignone, P. C. Schneider, S. Czesla, and J. H. M. M. Schmitt. TPCI: the PLUTO-CLOUDY Interface . A versatile coupled photoionization hydrodynamics code. *A&A*, 576:A21, Apr 2015
- 2015 G. Bodo, F. Cattaneo, A. Mignone, F. Ponso, and P. Rossi. Global Properties of Fully Convective Accretion Disks from Local Simulations. *ApJ*, 808(2):141, Aug 2015
- 2014 D. M. A. Meyer, J. Mackey, N. Langer, V. V. Gvaramadze, A. Mignone, R. G. Izzard, and L. Kaper. Models of the circumstellar medium of evolving, massive runaway stars moving through the Galactic plane. *MNRAS*, 444(3):2754–2775, Nov 2014
- 2014 M. Belan, D. Tordella, S. De Ponte, A. Mignone, and S. Massaglia. Hypersonic jets in astrophysical conditions: focus on spreading and asymmetric stability properties. *New Journal of Physics*, 16(8):085002, Aug 2014
- 2014 M. Anjiri, A. Mignone, G. Bodo, and P. Rossi. Linear and non-linear evolution of current-carrying highly magnetized jets. *MNRAS*, 442(3):2228–2239, Aug 2014
- 2014 A. Mignone. High-order conservative reconstruction schemes for finite volume methods in cylindrical and spherical coordinates. *Journal of Computational Physics*, 270:784–814, Aug 2014
- 2014 G. Bodo, F. Cattaneo, A. Mignone, and P. Rossi. On the Convergence of Magnetorotational Turbulence in Stratified Isothermal Shearing Boxes. *ApJ*, 787(1):L13, May 2014
- 2014 Matthias Stute, José Gracia, Nektarios Vlahakis, Kanaris Tsinganos, Andrea Mignone, and Silvano Massaglia. 3D simulations of disc winds extending radially self-similar MHD models. *MNRAS*, 439(4):3641–3648, Apr 2014
- 2014 M. Guarrasi, F. Reale, S. Orlando, A. Mignone, and J. A. Klimchuk. MHD modeling of coronal loops: the transition region throat. *A&A*, 564:A48, Apr 2014
- 2014 O. Teşileanu, T. Matsakos, S. Massaglia, E. Trussoni, A. Mignone, N. Vlahakis, K. Tsinganos, M. Stute, V. Cayatte, C. Sauty, C. Stehlé, and J. P. Chièze. Young stellar object jet models: From theory to synthetic observations. *A&A*, 562:A117, Feb 2014
- 2013 A. Mignone, E. Striani, M. Tavani, and A. Ferrari. Modelling the kinked jet of the Crab nebula. *MNRAS*, 436(2):1102–1115, Dec 2013
- 2013 Stefan M. Kolb, Matthias Stute, Wilhelm Kley, and Andrea Mignone. Radiation hydrodynamics integrated in the PLUTO code. *A&A*, 559:A80, Nov 2013
- 2013 Dipanjan Mukherjee, Dipankar Bhattacharya, and Andrea Mignone. MHD instabilities in accretion mounds - I. 2D axisymmetric simulations. *MNRAS*, 430(3):1976–1987, Apr 2013
- 2013 Dipanjan Mukherjee, Dipankar Bhattacharya, and Andrea Mignone. MHD instabilities in accretion mounds - II. 3D simulations. *MNRAS*, 435(1):718–727, Oct 2013
- 2013 G. Bodo, G. Mamatsashvili, P. Rossi, and A. Mignone. Linear stability analysis of magnetized relativistic jets: the non-rotating case. *MNRAS*, 434(4):3030–3046, Oct 2013
- 2013 G. Bodo, F. Cattaneo, A. Mignone, and P. Rossi. Fully Convective Magnetorotational Turbulence in Stratified Shearing Boxes. *ApJ*, 771(2):L23, Jul 2013
- 2013 P. Tzeferacos, A. Ferrari, A. Mignone, C. Zanni, G. Bodo, and S. Massaglia. Effects of entropy generation in jet-launching discs. *MNRAS*, 428(4):3151–3163, Feb 2013
- 2013 D. Tordella, M. Iovieno, S. Massaglia, and A. Mignone. Large-eddy simulation of hypersonic flows. Selective procedure to activate the sub-grid model wherever small scale turbulence is present. *Computer Physics Communications*, 184(12):2651–2661, Dec 2013
- 2012 G. Bodo, F. Cattaneo, A. Mignone, and P. Rossi. Magnetorotational Turbulence in Stratified Shearing Boxes with Perfect Gas Equation of State and Finite Thermal Diffusivity. *ApJ*, 761(2):116, Dec 2012
- 2012 Andrea Mignone, G. Bodo, and M. Ugliano. *Approximate Harten-Lax-van Leer Riemann solvers for relativistic magnetohydrodynamics*, pages 219–226. 2012
- 2012 A. Mignone, M. Flock, M. Stute, S. M. Kolb, and G. Muscianisi. A conservative orbital advection scheme for simulations of magnetized shear flows with the PLUTO code. *A&A*, 545:A152, Sep 2012
- 2012 T. Matsakos, N. Vlahakis, K. Tsinganos, K. Karamelas, C. Sauty, V. Cayatte, S. P. Matt, S. Massaglia, E. Trussoni, and A. Mignone. Velocity asymmetries in young stellar object jets. Intrinsic and extrinsic mechanisms. *A&A*, 545:A53, Sep 2012
- 2012 O. Teşileanu, A. Mignone, S. Massaglia, and F. Bacciotti. Numerical Simulations of Radiative Magnetized Herbig-Haro Jets: The Influence of Pre-ionization from X-Rays on Emission Lines. *ApJ*, 746(1):96, Feb 2012
- 2012 A. Mignone, C. Zanni, P. Tzeferacos, B. van Straalen, P. Colella, and G. Bodo. The PLUTO Code for Adaptive Mesh Computations in Astrophysical Fluid Dynamics. *ApJS*, 198(1):7, Jan 2012

Publications (2012-2015)

Conferences & Workshops

I have participated as invited speaker to more than 30 among international conferences and schools. Here I report the most significant contributions over the last five years:

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| 2020 | Colloquium | Heidelberg Joint Astronomical Colloquium, Dec 01 2020 (online) - Talk: <i>"Frontiers of high-energy computational astrophysics: bridging gaps between large and small scales"</i> . |
| 2020 | Conference | The Building Block of Planet , Online meeting, 14 - 17 April 2020 - Talk: <i>"Numerical Methods for Dust-Gas Interaction: a Review"</i> |
| 2020 | School | AstroSim2019: Ecole AstroSim pour l'astrophysique numérique , 27 Jan-7 Feb 2020 CINES Montpellier (France) - Lectures: <i>"Finite Volume Numerical Methods for Hydrodynamics: I-discretization techniques / II-MHD, Riemann solvers & the PLUTO Code / III-The PLUTO Code, relativistic MHD, particle-gas hybrid schemes, radiation transport"</i> ; Practice Session: <i>"A Practical Introduction to the PLUTO Code"</i> |
| 2019 | Conference | The 3C Extragalactic Radio Sky: Legacy of the Third Cambridge Catalogue . 16-20 Sep, 2019 Torino (Italy) - Talk: <i>"Frontiers in Computational Plasma Astrophysics: connecting small and large scales"</i> . |
| 2019 | School | NBIA Summer School on protoplanetary disks and planet formation , 5-9 Aug, 2019 Niels Bohr Institute, Copenhagen (Denmark) - Lectures: <i>"Finite Volume Numerical Methods for Hydrodynamics"</i> . |
| 2019 | Conference | ASTRONUM 2019 - The 14th International Conference on Numerical Modeling of Space Plasma Flows , Paris (France) 1-5 July, 2019 - Talk: <i>"Particle-Gas Hybrid Schemes in the PLUTO Code"</i> . |
| 2019 | Colloquium | Department of Physics and Astronomy, University of Bologna (Italy), June 2019 - Talk: <i>"Frontiers of High-Energy Computational Astrophysics: Bridging Gaps between Large and Small Scales"</i> . |
| 2019 | School | The multiple approaches to plasma physics from laboratories to astrophysics , Les Houches (France) 13-24 May, 2019 - Lectures: <i>"Numerical Methods for Astrophysical Fluid Dynamics"</i> . |
| 2018 | School | CINECA: HPC Methods for Computational Fluid Dynamics , Roma (Italy) 3-5 Dec, 2018 - Lectures: <i>"Numerical Methods for Hydrodynamics"</i> , <i>"Introduction to the PLUTO code"</i> . |
| 2018 | Colloquium | Max Planck Institute for Astronomy, Heidelberg (Germany) July 2018 - Talk: <i>"The PLUTO Code for Astrophysical Plasma: Present and Future Directions"</i> . |
| 2018 | Conference | Blazars & Beyond , Half a Century of Blazars and Beyond, Torino (Italy) 11-15 June, 2018 - Talk: <i>"Extragalactic Jet Dynamics after Half a Century of MHD modelling. Where are we ?"</i> . |
| 2018 | Colloquium | Institut de planétologie et d'astrophysique (IPAG), Grenoble (France), May 2018 - Talk: <i>"High Energy Astrophysics with the PLUTO Code: where we are and where we are going"</i> . |
| 2017 | Symposium | A DECADE OF AGILE: RESULTS, CHALLENGES AND PROSPECTS OF GAMMA-RAY ASTROPHYSICS , Accademia dei Lincei, Rome (Italy) Dec 11-13, 2017 - Talk: <i>"MHD Simulations of the Crab-Nebula Jet"</i> . |
| 2017 | School | CINECA: HPC Methods for Computational Fluid Dynamics & Astrophysics , Bologna (Italy) 13-15 Nov, 2017 - Lectures: <i>"Numerical Methods for Hydrodynamics"</i> , <i>"Introduction to the PLUTO code"</i> . |
| 2017 | Conference | ICNSP 2017: International Conference on Numerical Simulation of Plasmas , Leuven (Belgium) 18-20 Sept, 2017 - Talk: <i>"RECENT ADVANCES IN THE PLUTO CODE: towards fluid-particle hybrid models"</i> . |
| 2017 | Workshop | Workshop in honor of R. Rosner , Dept. of Astronomy & Astrophysics, Chicago (USA), Sep 2017 - Talk: <i>"Computational Astrophysics with the PLUTO code: from past to present and future directions"</i> . |
| 2017 | School | From Laboratories to Astrophysics: The expanding universe of plasma physics . Les Houches (France) 2-12 May, 2017 - Lecture: <i>"Numerical Methods for Astrophysical Fluid Dynamics"</i> . |

- 2016 Workshop **Modelling Pulsar Wind Nebulae**, Sant Cugat, Barcelona (Spain) 14-17 June, 2016. Talk: “*MHD modeling: aims, usage, scales assessed, caveats, codes*”.
- 2016 School **CINECA: HPC Methods for Computational Fluid Dynamics & Astrophysics**, Bologna (Italy) 2-4 Nov, 2016 - Lecture: “*Numerical Approaches to Fluid- and Magnetohydrodynamics in Astrophysics*”.
- 2015 Conference **ASTRONUM - 2015**, the 10th Annual International Conference on Numerical Modeling of Space Plasma Flows in Avignon, France 8 - 12 June, 2015 - Talk: “*Jacobian-Free Riemann Solvers for Hyperbolic Conservation Laws*”.
- 2014 Conference **Accretion and outflows throughout the scales: from YSO to AGN**, Lyon (France) - Talk: “*Instabilities of Current-Carrying Relativistic Jets*”.
- 2013 Conference **Summer School on Computational Astrophysics**, Niels Bohr Institute (Copenhagen, Denmark) - Lecture: “*Discretization methods and accretion disk modeling*”.
- 2013 Conference **ASTRONUM 2013**, Biarritz (France) - Talk: “*Fluid Instabilities in the Crab Nebula*”.
- 2013 Conference **Physical Processes in Astrophysical Plasmas**, University of Turin, Torino (Italy) - Talk: “*Simulations of Jets in the Crab Nebula*”.
- 2012 Conference **International School of Space Science**, L'Aquila (Italy) - Lecture: *Numerical Methods, MHD*.
- 2012 Conference **Flaring Crab Meeting**, Rome (Italy) - Talk: “*Kink Instabilities in the Crab Jet: Results from Numerical Simulations*”.
- 2012 Conference **EWASS - Formation and Disruption of jets in black-hole binaries and AGNs**, Pontificia Università Lateranense, Rome (Italy) - Talk: “*Numerical Simulations of Relativistic Jets from Accreting Black Holes*”.
- 2011 School **School and Conference on ANALYTICAL and COMPUTATIONAL ASTROPHYSICS**, ICTP (Trieste, IT), 14-25 November 2011 - Lecture(s): “*Numerical Simulations of Astrophysical Fluids*”.
- 2011 Conference **Numerical Methods for Hyperbolic Equations Theory and Applications**, Faculty of Mathematics, Santiago de Compostela (SPAIN), July 4-8, 2011 - Talk: “*An Approximate Harten-Lax-van Leer Riemann Solver for Relativistic Magnetohydrodynamics*”.
- 2011 Conference **ASTRONUM - 2011: 6th International Conference on Numerical Modeling of Space Plasma Flows**, June 13th - June 17th 2011 Valencia (SPAIN) - Talk: “*Adaptive Mesh Computations with the PLUTO code for Astrophysical Fluid Dynamics*”.
- 2011 Workshop **Cray-TIFR Workshop on High Performance Computing in Physics**, Tata Institute of Fundamental Research, Mumbai 400005, India, February 7th - 8th 2011 - Talk: “*Computational Astrophysics: present and future challenges*”, Lecture: “*Numerical Methods for Compressible Flows*”.
- 2010 Workshop **Computational Relativistic Astrophysics: Frontiers of MHD**, Princeton Center for Theoretical Science, January 13th - 16th 2010 - Talk: “*On the fate of relativistic magnetized jets: computational and theoretical challenges*”.
- 2009 Conference **ASTRONUM - 2009: 4th International Conference on Numerical Modeling of Space Plasma Flows**, June 29th - July 3rd 2009 Chamonix, FRANCE - Talk: “*High-Order Finite Difference Schemes for computational MHD*”.
- 2009 Conference **The high energy astrophysics of outflows from compact objects**, Ringberg Castle, Tegernsee, December 7th - 13th 2008 - Talk: “*Deceleration of 3D relativistic magnetized jets in FRI sources*”.

Conferences & Workshops

Conferences & Workshops

- 2008 Conference **Protostellar Jets in Context**, 7-12 July 2008, island of Rhodes, Greece - Talk: *"Aspect Ratio Dependence in MRI Shearing Box Simulations"*.
- 2008 Conference **ASTRONUM 2008: 3RD International Conference on Numerical Modeling of Space Plasma Flows**, Westin Hotel, St. John, U.S. Virgin Islands, 8-13 June 2008 - Talk: *"The PLUTO Code for computational astrophysics"*.
- 2007 School **JETSET School and Workshop: Numerical MHD and Instabilities Visualization techniques and virtual reality** Sauze d'Oulx, Torino, Italy January 8-13, 2007 - Talk 1: *"Oscillatory Instability of Radiative Shock Waves"*, Talk 2: *"Understanding Numerical Codes and Application to Astrophysical Problems"*, Talk 3: *"Code to Code comparison"*.
- 2007 Workshop **JETSET Workshop On Global Jet Simulations**, Landessternwarte Knigstuhl, Heidelberg(Germany), January 2007 - Talk: *"Recent development in the PLUTO code"*.
- 2007 Conference **XCII Congresso Nazionale della Società Italiana di Fisica(SIF)**, Torino 2007 - Talk: *"PLUTO: a modular code for computational astrophysics"*.
- 2007 School **School on Astrophysical Fluid Dynamics**, 15-26 October 2007, Abdus Salam International Centre for Theoretical Physics, Miramare, Trieste, Italy - Lecture: *"Computational Astrophysics"*.
- 2004 Conference **Large-Scale Computation in Astrophysics**, Isaac Newton Institute, Cambridge, UK, 13 Oct. 2004 - Talk: *"PLUTO: a modular code for computational astrophysics"*.
- 2003 Conference **Virtual Astrophysical Jets** Dogliani(IT), October 2003 - Talk: *"Astrophysical Jet Simulations: Comparing Different Numerical Methods"*