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Scientific fields of interest:

- Astroparticle physics and High-Energy Astrophysics
- Space Plasmas
- Cosmic-ray acceleration in relativistic subluminal and superluminal plasmas and extragalactic jets
- Radiation processes in Super Novae, Active Galactic Nuclei and Gamma-Ray-Bursts environments
- Computational modelling and simulations
- Big Data
- Neural networks and A.I.

Selected publications:

Nishikawa, K-I., Mizuno, Y., Gómez, J., Duğan, I., Meli, A., White, C., Niemiec, J., Kobzar, O., Pohl, M., Pe'er, A.,
Microscopic Processes in Global Relativistic Jets Containing Helical Magnetic Fields: Dependence on Jet Radius
Galaxies, 2017, 5, 58

Mizuno, Y., Gómez, J., Nishikawa, K-I., Meli, A., Hardee, P., Rezzolla, L., Singh, C., Pino, E.
Magnetic Dissipation in Relativistic Jets
Galaxies, 2016, vol. 4, issue 4, p. 40

Mizuno, Y., Gómez, J., L.; Nishikawa, K-I., Meli, A., Hardee, P. E., Rezzolla, L.
Recollimation Shocks in Magnetized Relativistic Jets
The Astrophysical Journal, 2015, 809, 38

Meli, A. and Biermann, P. L.
Active Galactic Nuclei and Multiple Conical Shock Acceleration: Starved Spectra
Astronomy & Astrophysics, 2013, A&A, 556A, 88

Meli, A., Becker, J. K., Quenby, J. J.:
Active Galactic Nuclei and Gamma Ray Bursts: Relativistic shocks and the origin of ultra high energy cosmic rays
Nucl.Instrum.Meth. Phys. Res., 2010, 630, 95

Biermann, P. L., Becker, J. K., Meli, A., Seo, E.-S., Stanev, T.:
The WMAP Haze from the Galactic Center Region Due to Massive Star Explosions and a Reduced Cosmic Ray Scale Height
The Astrophysical Journal, 2010, 710L, 53

Dieckmann, M. E., Murphy, G., Meli, A., Drury, L O C:
Particle-in-cell simulation of a mildly relativistic collision of an electron-ion plasma carrying a quasi-parallel magnetic field: Electron acceleration and magnetic field amplification at supernova shocks
Astronomy & Astrophysics, 2010, 509, 89

Biermann, P. L., Becker, J. K., Meli, A., Rhode, W., Seo, E. -S.; Stanev, T.:
Cosmic ray electrons and positrons from supernova explosions of massive stars
Physical Review Letters, 2009, Vol. 103, Issue 6, id. 061101

Meli, A., Becker, J. and Quenby, J. J.:
Cosmic ray acceleration in subluminal and superluminal relativistic shock environments
Astronomy & Astrophysics, 2008, 492, 323

Dieckmann, M. E., Meli, A. Shukla, P. K. and Drury, L. O', Mastichiadis, A.:
Two-dimensional PIC simulations of ion-beam instabilities in Supernova-driven plasma flows
Plasma Physics and Controlled fusion, 2008, Vol. 50, Issue 6, id. 065020

Meli, A. and Quenby, J. J.:
Shock Acceleration at Super-luminal Relativistic Shocks – A Numerical Study
Nuclear Physics B, 2006, Vol. 151, Issue 1, p. 505-508

Meli A. and Biermann P.L.:
Cosmic Rays X. The cosmic ray knee and beyond: diffusive shock acceleration at oblique shocks
Astronomy and Astrophysics 2006, 454 687