

Bari, 8th September 2023

Early Career Investigators Committee Report

Pierluca Carenza
Stockholm University, OKC

Colloquia

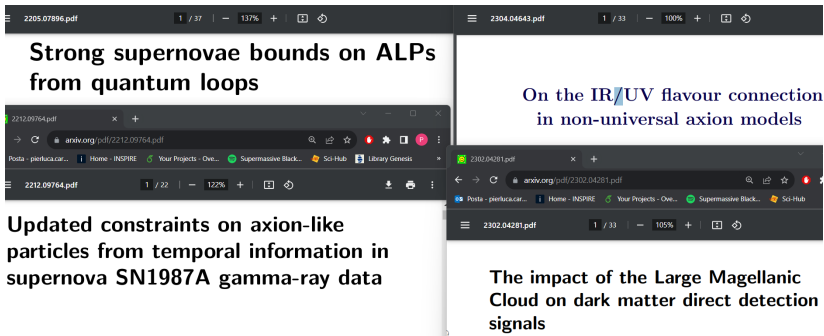
Arturo De Giorgi, Giuseppe Lucente

- ▶ *Feb. 1.* Light, Feebly Interacting Particles: Progress and Expectations
Maurizio Giannotti
- ▶ *Mar. 29.* Revealing Structure in the Axiverse
Liam McAllister
- ▶ *Apr. 17.* Neutron stars as axion laboratories
Samuel Witte
- ▶ *May 31.* Axion dark matter: A perspective for the post-inflationary scenario
Kenichi Saikawa
- ▶ *Jun. 21.* In search for ultralight (pseudo)scalars and other dark matter wannabes
Dmitry Budker

Journal Club

María Benito Castano, Michele Tamaro

Monthly meeting to discuss interesting papers



Newsletter

Damiano Fiorillo, Giovanni Grilli di Cortona

Monthly update on physics and beyond Just an extract...

- "Supernova Simulations Confront SN 1987A Neutrinos," - D. F. G. Fiorillo, M. Heinlein, H.-T. Janka, G. Raffelt, E. Vitagliano, arXiv:[2308.01403](https://arxiv.org/abs/2308.01403) [hep-ph]

We return to interpreting the historical SN 1987A neutrino data from a modern perspective. We construct a suite of spherically symmetric supernova models, using four different equations of state and five choices of final baryons neutron-star (NS) mass. Our models include muons and proto-neutron star (PNS) convection. Our models generally show compatibility with the combined data of the four relevant experiments, IMB, Kam-II, BUST, and LSD, although IMB alone favors a NS mass of 1.7-1.8 solar masses, while Kam-II alone favors a mass around 1.4 solar masses. Due to PNS convection and nucleon correlations in the neutrino opacities, the predicted PNS cooling time is of 3-9 s, in conflict with late event bunches in Kam-II and BUST after 8-9 s. Speculative interpretations include the onset of fallback of transiently ejected material onto the NS, a late phase transition in the nuclear medium, or other effects adding to the standard PNS cooling emission.

- "Search for environment-dependent dilatons," - Hanke Fischer, Christian Käding, René I. P. Sedmik, Hartmut Abele, Philippe Brax, Mario Pitschmann, arXiv: [2307.00243](https://arxiv.org/abs/2307.00243)[hep-ph]

The environment-dependent dilaton field is a well-motivated candidate for dark energy and naturally arises in the strong coupling limit of string theory. We present the very first experimental constraints on the parameters of this model. For this, we employ data obtained from the qBounce collaboration and the Lunar Laser Ranging (LLR) experiment. Furthermore, we forecast expected exclusion plots for the Casimir And Non Newtonian force EXperiment (Cannes) soon to be realised in an improved setup.

PhD/Postdoc/Junior Positions

- **September:**
 - Postdoctoral position in particle physics (Belle-II), Strasbourg IPHC, France, [link](#) (deadline September 30th)
 - Research Fellow in HEP and Quantum computing, U. Southampton, UK, [link](#) (deadline September 15th)
 - PostDoc on the application of Machine Learning to particle Physics, OAW, Vienna, Austria, [link](#) (deadline September 15th)
 - Call for Expression of interest: tenure track positions in physics, IST Lisbon, Portugal, [link](#) (deadline September 22nd)
- **October:**
 - Arnold Fellowships and Landau Fellowships in Physics and Mathematics, London Institute for Mathematical Sciences, UK, [link](#) (deadline October 1st)
 - Research fellowships, Liverpool U., UK, [link](#) (deadline October 1st)
 - Postdoc position in theoretical physics, IFT Madrid, Spain, [link](#) (deadline October 5th)
 - Junior professorship in Theoretical Physics, KIT, Karlsruhe, Germany, [link](#) (deadline October 15th)
 - Tenure track assistant professorship, Eotvos U., Budapest, Hungary, [link](#) (deadline October 15th)
- **November:**
 - Postdoc in Theoretical Particle Physics, Stefan Inst., Ljubljana, Slovenia, [link](#) (deadline November 5th)

Conferences

- **September:**
 - 1st General meeting of COST Action COSMIC WISPers [link](#)
 - Particle Avenues in the Dark Universe Arena [link](#)
 - TeVPA 2023 [link](#)
 - 1st training school of COST Action COSMIC WISPers [link](#)
 - Light Dark World 2023 [link](#)

Send paper to Damiano & Giovanni to be advertised

Social media

Giuseppe Lucente, Mario Reig

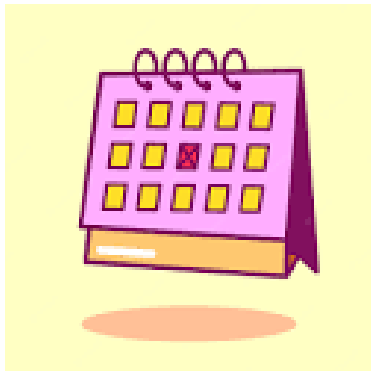
On twitter: cosmicwispers



Role of these initiatives

- ▶ Run daily activities to consolidate a community
- ▶ Inform all of us of what's going on
- ▶ Drive the interests towards studies with a bright future

For next year



- ▶ Collaboration for outreach activities
- ▶ Extend the network

Discussion time

