Napoli, 27-28 gennaio 2020, Kick-off meeting PRIN NAT-NET

PRIN

[Progetto di Rilevante Interesse Nazionale]

NAT-NET

[Neutrino and Astroparticle Theory NETwork]

INTRODUZIONE

Eligio Lisi
(INFN, Bari)

Grazie a tutti (compresi gli assenti),
e in particolare agli amici di Napoli,
per il generoso impegno
nell'organizzazione
di questo kick-off meeting!

Piccioni Pancini Conversi

Origini del nostro PRIN...

- 1999-2012: Precedenti PRIN astroparticellari; P.I. Fogli, Masiero, Fornengo (Uni)
- 2017 (27 dicembre): esce il bando “PRIN 2017”, lungamente atteso
- 2018 (gennaio): discussione, configurazione <6 unità impedisce PRIN “grandi”
- 2018 (febbraio): convergenza su proposta di PRIN “Linea Sud” Bari-L’Aquila-Napoli
- 2018 (feb-mar), burocrazia: 3 sedi → 5 unita’: INFN+UniBa+UniNa+UnivAq+GSSI
- 2018 (29 marzo), chiusura e sottomissione, sigla NAT-NET; chiesti 330 kE al MIUR
- 2019 (5 marzo), approvazione, sigla 2017W4HA7S; ricevuti 296 kE dal MIUR
- 2019 (29 agosto), inizio ufficiale del nostro PRIN, P.I. Lisi (INFN)
- 2022 (28 agosto) termine ufficiale del nostro PRIN

Ampia sovrapposizione con iniziativa specifica TAsP (ex FA51) dell’INFN:
Comunità scientifica con una solida tradizione in campo astroparticellare

Abstract

Neutrino and Astroparticle Physics represent rapidly evolving fields at the crossroad of particle physics, astrophysics and cosmology. In this context, the project NAT-NET (Neutrino and Astroparticle Theory Network) is being proposed by research groups based in Bari, Naples and L'Aquila, with a strong tradition of common interests and research activities in astroparticle theory and phenomenology. NAT-NET builds upon previous collaboration experiences involving the Universities and INFN branches of Bari, Naples and L'Aquila and, more recently, the Gran Sasso Science Institute.

NAT-NET aims at performing top-level research on open problems in neutrino and astroparticle physics, including: deeper understanding of neutrino mass-mixing phenomena (flavor oscillations, absolute mass observables, possible new states and interactions) in different energies ranges (from meV relic to PeV astrophysical neutrinos); studying astrophysical neutrino sources in a multi-messenger approach; addressing issues related to early-universe and large-scale aspects of the cosmological model, such as matter-antimatter asymmetry, nucleosynthesis, and dark matter. This research program will be integrated by: exchange visits; co-tutoring of students; organization of common events; outreach activities.

Responsabili di Unità:

LISI Eligio (INFN), → **P.I.**
MARRONE Antonio (Bari)
MIELE Gennaro (Napoli Federico II)
PAGLIAROLI Giulia (Gran Sasso Science Institute) → **Under 40**
VILLANTE Francesco Lorenzo (L'Aquila)

+ Membri iniziali e nuovi afferenti (ricordate di formalizzare!)

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Siamo qui per realizzare insieme una disequazione spesso invocata in passato:

PRIN > Σ_i attività$_i$

Focus: cosa stiamo facendo e come potremmo fare (meglio) network su

WP1 - Standard neutrino framework. Investigation of the remaining unknowns of the three-neutrino framework (absolute masses and their ordering, Dirac/Majorana nature, CP phases); refinement of our understanding of neutrino oscillations in vacuum, in matter and with self-interactions; neutrinoless double beta decay with light Majorana neutrinos: constraints on its nuclear model uncertainties and connections with cosmological bounds.

WP2 - Beyond the standard neutrino framework. Sterile neutrino oscillations in the light of upcoming laboratory and cosmological data; constraints on new neutrino interactions; neutrinoless double beta decay beyond light Majorana neutrinos; long-distance and multi-messenger tests of dispersion relations; neutrinos as components or signals of dark matter; neutrino model building and leptogenesis.

WP3 - Sources and fluxes of neutrinos and of other messengers. From low to high energy: relic neutrino detection prospects; axions and axion-like particles in astrophysical contexts; issues in big-bang nucleosynthesis neutrinos; improvements of solar neutrino models and low-energy flux detection; set-up of a reference geo-neutrino model; tests of core-collapse supernova physics; high-energy neutrinos: study of astrophysical sources (within a multimessenger approach) and of propagation in the Earth.

WP4 - The standard cosmological model and beyond. Nonstandard scenarios for the relic neutrino background and big-bang nucleosynthesis; pre-big-bang and string cosmology; effects of large-scale inhomogeneities and anisotropies; laboratory approaches to vacuum energy; warm dark matter components via heavy neutrinos.

+ Formazione pre/postdoc + Organizzazione eventi + Divulgazione

specialmente fra **BA+AQ+NA** ma non solo (+RM, +PI, +FE etc.)

La differenza fra **>** e **=** dipende solo da noi...

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Buon lavoro a tutti!