INFN-Theory Group-Astroparticle

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Outline

- Overall INFN structures
- Collaboration teams-(*IS Iniziative specifiche*)
- Description of the collaboration teams
- Funding -refereeing of the collaboration teams

INFN structures

- INFN has 5 groups, one of which is the Theory group (~ 750 members) - chaired by G. Marchesini

- Theory group is divided in 6 subgroups, Astroparticle is one of them, with ~100 members

  (100% working on this subject/full time equivalent FTE)

- I am referee in collaboration with Francesco Vissani of the Astroparticle -Theory group of INFN

Astroparticle funding from INFN Theory

60% collaborations (IS)

travel +foreign visitors

~ 310 K€

+

extra INFN funds

~ 140 K€

Astroparticle

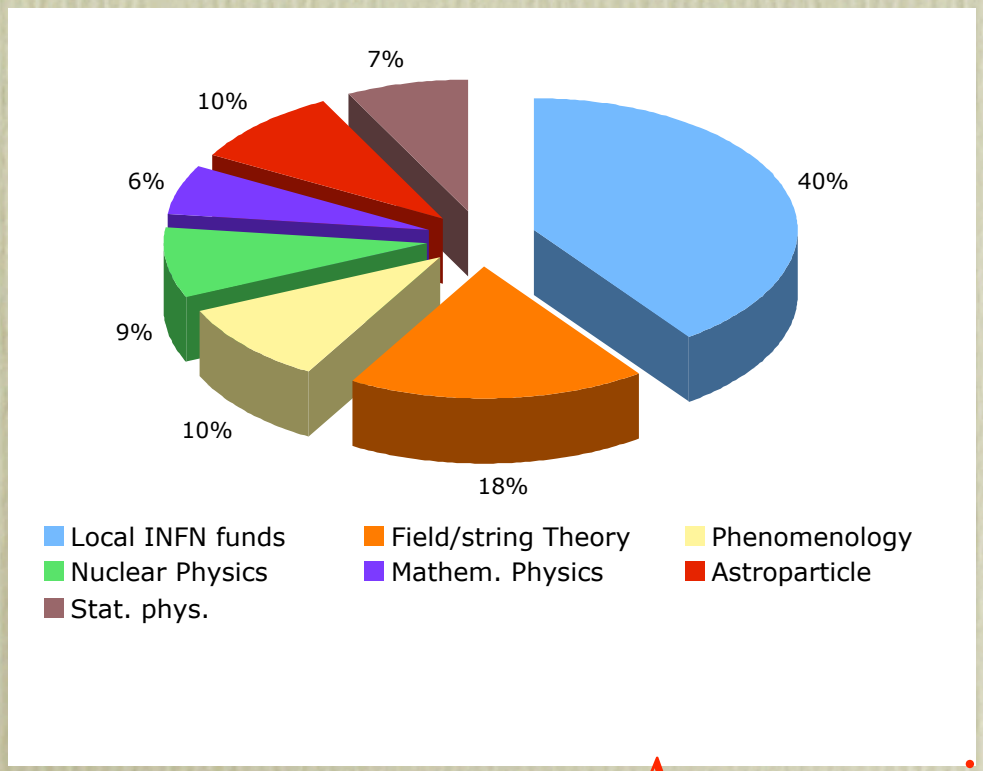
⇒ 450K€

extra INFN funds

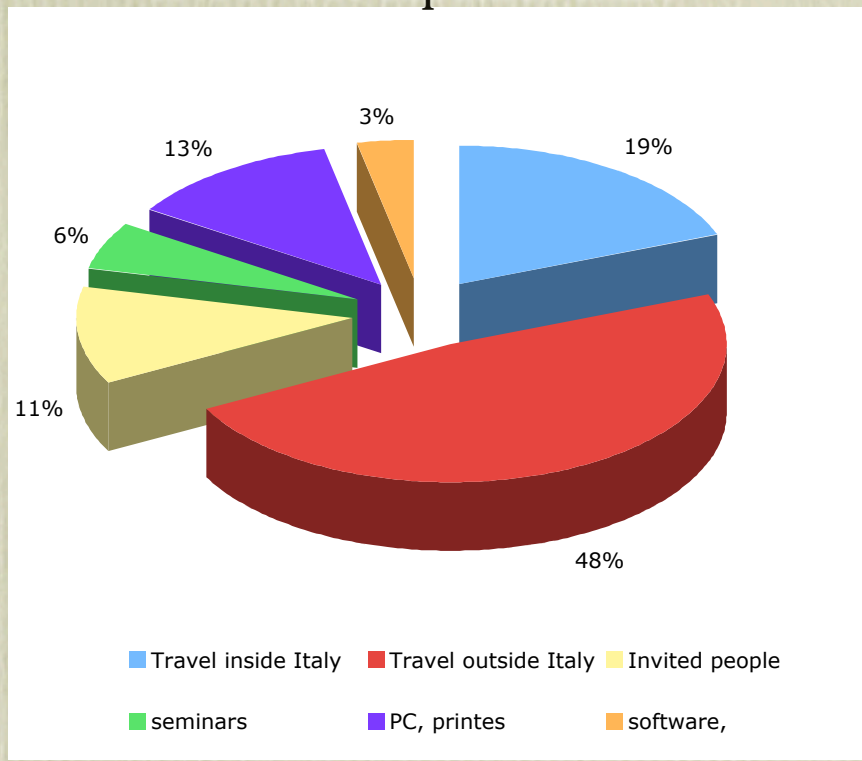
- travels
- seminars
- pc's, laptop, software
- foreign collaborators

≥ 3 M€ for INFN TH

Collaboration teams chart



INFN TH expenses chart



Astroparticle 450K€

Postdoc posititions

- INFN funds ten foreign TH post-docs per year. Fellows can choose where in ITALY : 2~3 go to astroparticles
- INFN funds also some TH post-docs for italians abroad: some (about 5) go to astroparticles

5 Collaboration- teams

- CT51 Compact stellar objects and dense hadronic matter (6 FTE)
- GS51 Phenomenolgy of planck scale physics (5 FTE)
- OG51 Modeling gravitational wave (GW) sources (11 FTE)
- PD51 Inflation, dark matter, and the large-scale structure (16 FTE)
- FA51 50 FTE : Four subgroups

FA51 50 FTE: four subgroups

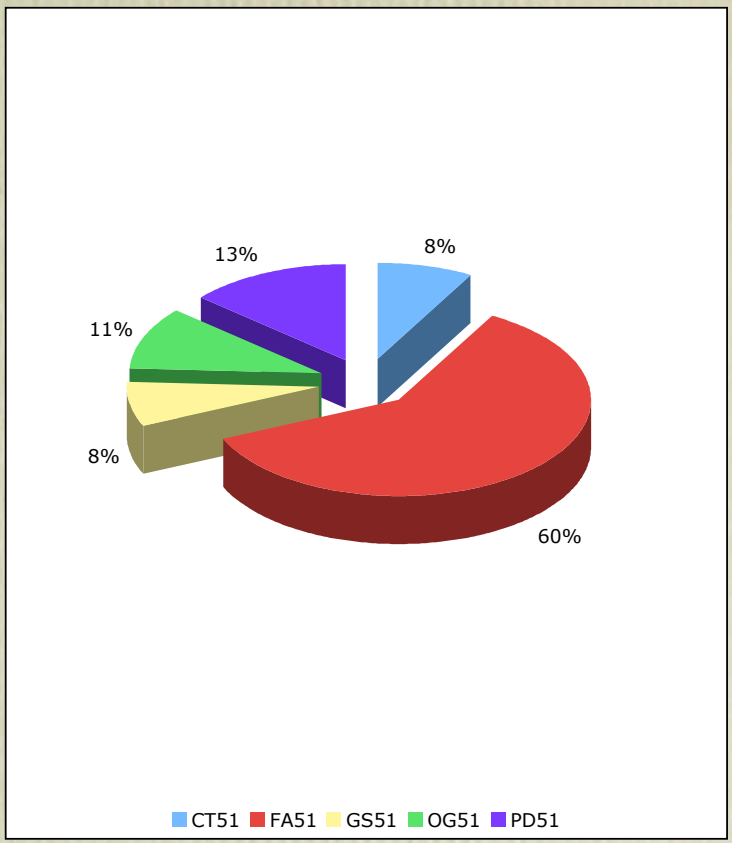
- A) Neutrinos in physics, astrophysics and cosmology (50%)
- B) Nuclear and subnuclear physics in the early universe (20%)
- C) Dark matter, dark energy and and cosmic structures (15%)
- D) Astrophysical sources of radiation (15%)

Chart of Collaboration teams

- CT51 Nucl.-astroph. (resp. M.Baldo)
- GS51 Phen. of Planck scale (resp. A. Grillo)
- OG51 Grav. waves (resp. V. Ferrari)
- PD51 Inflation,DM,structures (resp.S. Matarrese)

FA51 (resp.G. Fogli)

- A) Neutrinos (50%)
- B) Early universe (20%)
- C) Dark matter/ energy (15%)
- D) Astrophysical /radiation (15%)



Astroparticles

Budget follows FTE's

Physics highlights

- CT51 COMPACT STELLAR OBJECTS AND DENSE HADRONIC MATTER European Project ESF (CompStar)
- GS51 PHENOMENOLOGY OF PLANCK SCALE PHYSICS (relation with AGN)
- Purpose of the OG51 collaboration is modeling gravitational wave (GW) sources through theoretical studies and numerical simulations.
- PD51 INFLATION: THEORETICAL PREDICTIONS AND OBSERVATIONAL TESTS. Study of CMB anisotropies: BOOMERanG, MAXIMA-I, DASI, CBI, ARCHEOPS, WMAP . DARK MATTER AND DARK ENERGY: ASTROPHYSICAL AND COSMOLOGICAL ASPECTS PAMELA, AGILE and GLAST

FA51: largest team

(for historical reasons: I coll. team)

- A) Neutrinos (50%)
- B) Early universe (20%)
- C) Dark matter/ energy (15%)
- D) Astrophysical /radiation (15%)

- A) NEUTRINOS IN PHYSICS, ASTROPHYSICS AND COSMOLOGY Solar neutrino physics, stellar astrophysics, Physics of atmospheric and (long-baseline) accelerator neutrinos, Properties of neutrinos of astrophysical origin (supernovae, nucleosynthesis).Absolute neutrino masses.
- B) NUCLEAR AND SUBNUCLEAR PHYSICS IN THE EARLY UNIVERSE Extended theories of gravitation and cosmology, CP violation, baryogenesis and leptogenesis,big bang nucleosynthesis
- C) DARK MATTER, DARK ENERGY AND AND COSMIC STRUCTURES Supersymmetric and mirror models Direct and indirect signatures of particle dark matter Cosmic background radiation (CMBR)
- D) ASTROPHYSICAL SOURCES OF RADIATION Nuclear reactions and stars evolution. Ultra high energy cosmic rays,Gamma ray bursts

European networks:
ILIAS
ENTAPP
ISAPP

PhD Thesis

	CT	GS	OG	PD	FA
FTE	6	5	11	16	50
PhD 2004	1	-	2	1	9
PhD 2005	1	0	0	1	5
PhD 2006	0	0	1	4	5
PhD 2007	1	2	5	3	4
	3	2	8	9	23

GS51 new

Popular papers in the last three years

	CT	GS	OG	PD	FA
>10 citations	9	18	8	66	115
>50 citations	0	0	1	6	15
>100 citations	0	0	0	2	5

Popular authors: G.Fogli (BA), S. Matarrese(PD)
S.T. Petcov (TS) (seniors); E. Lisi (BA), A. Strumia
(PI),P.Ullio(TS) (mature); G.Bertone (PD),
S. Liberati (TS) (junior)

Some popular papers in the last four years

# citations	Arguments	Authors	Collaboration
245	**Global analysis of three-flavor neutrino masses and mixings.**	G.Fogli-E.Lisi (BA), *et al.* Prog.Part.Nucl. Phys. 57:742, (06)	FA51
189	**Non-Gaussianity from inflation: Theory and observations**	S. Matarrese (PD) *et al.* Phys.Rept.402:103 (04)	PD51
189	**Dark SUSY:Computing supersymmetric dark matter properties numerically**	P. Ullio (TS) *et al.* JCAP 0407:008 (04)	FA51
145	**Theory of neutrinos: A White paper**	S.T. Petcov (TS) *et al.* Rept.Prog.Phys. 70:1757,(07)	FA51
131	**Neutrino masses and mixings and...**	A.Strumia (PI), F.Vissani (LNGS) hep-ph/0606054	PD51& FA51
134	**Implications of neutrino data circa 2005**	F. Vissani, (LNGS) *et al.* Nucl.Phys.B726:294-316,(05).	FA51

International refereeing every three years

- In order to finance our collaboration teams we ask several international referees to rate them (A,B,C)
- Local referees then finance accordingly