

# GGI PROGRAM « NEUTRINO FRONTIERS » - June 24 -July 19 2024

## TRAINING WEEK PROGRAM (25-28 June)

Monday  
H  
O  
L  
I  
D  
A  
Y

Tuesday

9:45-10:30

10:30-11:30

11:30-11:45

11:45-12:45

Welcome  
G. Barenboim:  
*« Introductory lectures  
on neutrinos »*  
Coffee break  
G. Barenboim:  
*« Introductory lectures  
on neutrinos »*

Lunch break

14:00-15:00

Y. Wong:  
*« Neutrinos in cosmology»*

15:15-16:15

S. Lavignac:  
*« Neutrinos and physics  
beyond the Standard Model»*

9:30-10:30

G. Barenboim:  
*« Introductory lectures  
on neutrinos »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

10:30-11:00

11:00-12:00

T. Kajita:  
*« A path to discovery:  
neutrinos and  
gravitational waves »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

T. Kajita:  
*« A path to discovery:  
neutrinos and  
gravitational waves »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

T. Kajita:  
*« A path to discovery:  
neutrinos and  
gravitational waves »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

T. Kajita:  
*« A path to discovery:  
neutrinos and  
gravitational waves »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

T. Kajita:  
*« A path to discovery:  
neutrinos and  
gravitational waves »*  
Coffee break  
Y. Wong:  
*« Neutrinos in cosmology»*

Lunch break

Y. Wong:  
*« Neutrinos in cosmology»*

F. Vissani:  
*« Neutrinos in astrophysics»*

S. Lavignac:  
*« Neutrinos and physics  
beyond the Standard Model»*

C. Volpe:  
*« Neutrinos in astrophysics»*

Talks from PhD students

R. Kumar (15')  
Neutrino mass sum rules from modular  
symmetry  
F. Verdiani (15')  
Nonlinear modelling of massive neutrino  
cosmologies in LSS  
A.K. Pradhan (15')  
Majorana Phase in two flavor neutrino oscillation  
with neutrino decay and decoherence  
S. Krieg (15')  
Neutrinos as gravitational wave detectors

Talks from PhD students

P. Adolf (15')  
Radiative neutrino masses and the  
Cohen-Kaplan-Nelson bound  
C.M. Ayber (15')  
Neutrino Masses from a Hybrid Type I + III  
inverse Seesaw Mechanism  
K. Prajapati (15')  
The dark hypercharge symmetry  
A. Tolino (15')  
PBH and HLD

L. Alvarez-Ruso:  
*« Neutrino interactions»*

END OF THE TRAINING WEEK

## FOCUS WEEK PROGRAM (1-5 July)

	Monday	Tuesday	Wednesday	Thursday	Friday
8:45-9:15	Registration				
9:15-9:30	Welcome				
9:30-10:05	G. Karagiorgi Beyond the Standard Model physics through neutrino experiments	S. Gariazzo Relic neutrinos: decoupling and direct detection perspectives	C. Arguelles New physics with astrophysical neutrinos: new ideas and opportunities	L. Strigari Neutrino physics with dark matter detectors	Z. Xing The first general and explicit connection between leptogenesis and CP violation in neutrino oscillations
10:15-10:45	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10:45-11:20	M. Archidiacono Towards neutrino mass detection from upcoming cosmological surveys	S. Pastor The effective number of neutrinos in non-standard scenarios	L. Alvarez-Ruso Non-standard interactions in neutrino scattering	P. Salucci New Paradigm and Scenario for the dark matter phenomenon	S. Chongdar (15') Explicit and Spontaneous CP Violation in case of triplet leptogenesis
	Lunch break	Lunch break	Lunch break	Lunch break	11h30-12h05 Y.Z. Qian Beyond-standard-model neutrino physics and core-collapse supernovae
14:00-14:35	D. Camarena Torres Probing self-interacting neutrinos with cosmological data	N. Saviano Leptogenesis in the light of primordial black holes	Seodong Shin Uncovering Secret Neutrino Interactions at Tau Neutrino Experiments	Dutta B. Light dark sector: inelastic exploration at neutrino experiments	Lunch break
14:45-15:20	P. Sahu Leptogenesis in a Left-Right Symmetric Model with double seesaw	N. Barbieri (15') Neutrinos in low reheating scenarios	F. Pompa (15') Neutrino masses from astro- to particle physics	P. Ivanez-Ballesteros (15') Supernova neutrinos and neutrino non-radiative decay	Discussions
15:30-15:50	Coffee break	Coffee break	Coffee break	Coffee break	Coffee
15:55-16:30	J. Hamann Efficient cosmological model selection with bayesian optimization	J. Froustey Moment linear stability analysis for neutrino flavor transformation	B. Littlejohn Status of Short-Baseline Anomalies in Neutrino Physics	Y. Wong Constraining the neutrino lifetime with precision cosmology	END OF THE FOCUS WEEK
17:30	<b>VISIT : HOUSE of GALILEO GALILEI</b>				
	21:00 <b>TALK for the PUBLIC (in italiano)</b> « Viaggio al centro del Sole » by Francesco Vissani				

## ASTROPHYSICAL WEEK 1 PROGRAM (8-12 July)

	Monday	Tuesday	Wednesday	Thursday	Friday
8:45-9:15	Registration				
9:15-9:30	Welcome				
9:30-10:05	Y.Z. Qian Signatures of high-energy neutrinos from sources for r-process nuclei	M. Spurio Neutrino telescopes in the context of multimessenger astrophysics	A. Smirnov Dark nature of neutrino mass	De Gouveia. Majorana versus Dirac, beyond Neutrinoless Double-Beta Decay	R. Surman Neutrinos and heavy element nucleosynthesis
10:05-10:15	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10:15-10:45	J. Lattimer The history of the r-process	M. Mukhopadhyay High-energy neutrino signatures from magnetar remnants of binary neutron star mergers	M. Sen Exploring the origin of neutrino mass in dark alleys	L. Graf Lepton number violation -- the key to neutrino physics?	Y. Perez-Gonzalez Insights into the final moments of a primordial black hole: a high-energy neutrino perspective
10:45-11:20					
11:30-12:05	T. Mueller Towards the discovery of the Diffuse Supernova Neutrino Background				
12:05-14:00	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
14:00-14:35	K. Scholberg Scattering in neutrino alley	T. Pitik High-energy Neutrino Emission from Interaction-powered Supernovae	Z. Berezhiani Sterile Neutrino Candidates: The Good, The Bad, The Ugly	M.V. Garzelli Prompt neutrinos in the atmosphere and at colliders	T.K. Poddar Neutrino astronomy and neutrino physics
14:35-14:45					
14:45-15:20	Y. Martinez-Soler New Clues about Light Sterile Neutrinos	Michiru Uwabo-Niibo (15') Updated constraints and future prospects on majoron dark matter	Z. Xiong Fast neutrino flavor conversions in a supernova: Emergence, evolution and effects	S. Palomares-Ruiz Neutrinos from dark matter captured in celestial bodies	J. Lattimer Neutron star mass and radius constraints, and correlations connecting them to the dense matter equation of state
15:20-15:30		Coffee break	Coffee break	Coffee break	Coffee break
15:30-15:50	Coffee break				
18:00	VISIT : HOUSE of GALILEO GALILEI				
19:00	RECEPTION DINNER				

# ASTROPHYSICAL WEEK 2 PROGRAM (15-19 July)

Monday

8:45-9:15 Registration  
9:15-9:30 Welcome

# D. Radice

## Neutrinos in Neutron Star Mergers

### Coffee break

# A. Perego

## Microphysics in BNS mergers: status and challenges

## Lunch break

14:00-	S. Ge
14:35	Fermion Oscillation in Dense Matter
14:45-	Y. Pehlivan
15:20	Spin-flavor precession phase effects in supernova
15:30-	Coffee break
15:50	
	15:55
	16:30

## **PTION DINNER**

Tuesday

A. Ianni  
Experimental observation of solar neutrinos: from  
the pp-chain to the CNO cycl

Coffee break

M. Giannotti  
Axions from the sky: perspectives on the detection of  
solar and other stellar axions

## Lunch break

F. Villante  
Solar models, solar neutrinos and helioseismology

K. Tobioka  
MeV sterile neutrinos in light of the Cabibbo-angle anomaly

Coffee break

S. Petcov  
Neutrino Masses, Mixing and Leptonic CP-Violation – Theory and Tests in Future Experiments

# Wednesday

I. Tamborra  
Messengers from the cosmos

Coffee break

T. Janka  
Neutrinos in and from core-collapse supernovae

## Lunch break

M. Mori  
Long-term supernova neutrino simulation and analysis method

L. Johns  
The thermodynamics of oscillating neutrinos

Coffee break

K. Mori  
Impacts of sterile neutrinos on supernova dynamics

Thursday

G. Sigl  
Some aspects of collective effects in neutrino oscillations

Coffee break

D. Fiorillo  
Subtleties and surprises of neutrino quantum kinetic equations

## Lunch break

11:30~  
12:05

Friday

G. Pagliaroli  
Core-collapse supernovae detection with neutrinos  
and gravitational waves

Coffee break

L. Bocciali  
Dependence of neutrino heating in the gain region of  
core-collapse supernovae on progenitor  
compactness

G. Raffelt  
Supernovae as Particle Physics Laboratories

Farewell

Lunch break

## Discussions

END OF THE PROGRAM  
«NEUTRINO FRONTIERS»