



Department of Physics, IIT Hyderabad presents



భారతీయ ఇంజనీరింగ్ టెక్నాలజీ సంస్థానం
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad



An International Conference

PHOENIX 2023

18-20 December

Thrust Areas

Beyond the Standard Model
Present and Future Colliders
Astroparticle Physics and Cosmology
Neutrino physics
Dark Matter



Venue

Convention Center
IIT Hyderabad
Kandi, Telangana, India

Contact

phoenix@phy.iith.ac.in
Phone: +91 040 2301 6023

Looking back through
history

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Anomalies 2019 : 18-20 July (Pre-COVID era)

An Indo-US joint workshop.

Funded by IUSSTF, SERB, IMSc (DAE).

First iteration: Offline @ IITH

Total participants: 130

Total speakers: 60



ANOMALIES 2019
Indo-US Workshop
18-20/07/2019, IIT Hyderabad Auditorium
Contents: B Anomalies, Collider physics, Neutrino physics, Dark matter

INVITED SPEAKERS

- Prof. Ben Grinstein
- Prof. Jure Zupan
- Prof. Alakabha Dutta
- Prof. Oliver Witzel
- Prof. Rohini Godbole
- Prof. Biswarup Mukhopadhyaya
- Prof. Debajyoti Choudhury
- Prof. Kajari Mazumdar
- Prof. Eung Jin Chun
- Prof. Joaquim Matias

ORGANIZERS

- Dr. Priyotosh Bandyopadhyay
IIT Hyderabad
- Prof. Rahul Sinha,
Institute of Mathematical Sciences, Chennai
- Dr. Bhupal Dev
University of Washington, St. Louis
- Prof. Amarjit Soni
Brookhaven National Lab

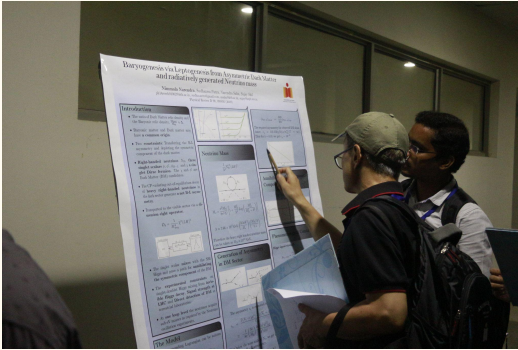
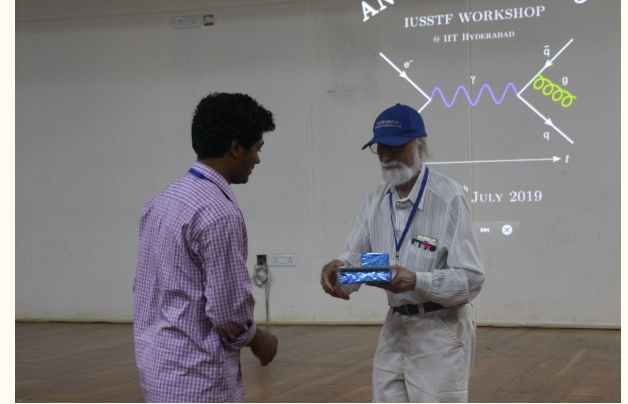
IIT Hyderabad, 2019

Registration opens on 15th Feb. 2019 | Early registration before 15th May 2019.

Website : <https://www.iith.ac.in/~anomalies19>

Logos: IIT Hyderabad, IUSSTF (Indo-US Science and Technology Forum), SERB (Department of Science and Technology), IAS (Indian Academy of Sciences), IISER (Indian Institute of Space Science and Technology), Brookhaven National Laboratory.

Anomalies 2019: Gallery



No Marriott
this time, not
enough
funding :(

Anomalies 2020: 11-13 September (The COVID era)

Organized online due to COVID.

Total participants: 128

Total speakers: 54

18 international speakers including

Prof. Eung Jin Chun

Prof. Katri Huitu

Prof. Mark Hindmarsh

Prof. Julia Gehrlein

Et al.



ANOMALIES 2020
International Conference (online)
IIT Hyderabad, Kandi, Telengana - 502285

Contents

- Dark matter anomalies by XENON1T
- Models with gravitational wave like signature
- Experiment vs theory on g-2 of electron and muon
- New developments on kaon Physics
- Lattice results on semileptonic B decays
- Neutrino Physics

National and International Organizing Committee

- Dr. Priyotosh Bandyopadhyay
Indian Institute of Technology, Hyderabad
- Prof. Rahul Sinha
Institute of Mathematical Sciences, Chennai
- Dr. Bhupal Dev
University of Washington, St. Louis
- Prof. Amarjit Soni
Brookhaven National Lab

Local Organizers

- Dr. Priyotosh Bandyopadhyay
- Prof. Anjan Giri
- Dr. Narendra Sahu
- Dr. Raghavendra Srikanth Hundi

11th - 13th September, 2020

For registration send an email to anomalies@iith.ac.in on or before 17th August 2020.
Website : <https://www.iith.ac.in/~anomalies19/anomalies2020>



Anomalies 2021: 10-12 November (COVID again)

Online once again.

Total participants: 153

Total speakers: 78

Contents

Gravitational wave like signature and finite temperature field theory

Hadronic & leptonic colliders

Flavour Physics & muon g-2

Dark matter & Neutrino Physics

Eminent Foreign Speakers

Wolfgang Altmannshofer, UC Santa Cruz
Sandhya Choubey, KTH, Stockholm
Eung Jin Chun, KIAS
Pietro Colangelo, INFN Bari
Laura Covi, U. Gottingen
Benjamin Grinstein, UC San Diego
Tao Han, U. Pittsburgh
Oleg Lebedev, U. Helsinki
Christoph Lehner, U. Regensburg
Bruce Mellado, U. Witwatersrand
Hitoshi Murayama, UC Berkeley, IPMU
Massimo Passera, INFN Padua
Mitesh Patel, Imperial Coll. London
Mariano Quiros, IFAE, Barcelona
B. Lee Roberts, U. Boston
German Valencia, U. Monash

ANOMALIES 2021

International Conference (online)
IIT Hyderabad, Kandi, Telengana - 502285



Eminent Indian Speakers

Satyaki Bhattacharya, SINP
Rohini Godbole, IISc
D. Indumathi, IMSc
Partha Konar, PRF
Anirban Kundu, U. Calcutta
Ranjan Laha, IISc
Kajari Mazumdar, TIFR
Subhadip Mitra, IIIT Hyderabad
Biswarup Mukhopadhyaya, IISER Kolkata
Santosh Rai, HRI
Sudhir Vempati, IISc
Urjit Yagnik, IIT Bombay

10th - 12th Nov, 2021

For registration, abstract submission and other queries please visit the following website:

<https://www.iith.ac.in/~anomalies19/anomalies2021.html>

Deadline for registration: 15th Oct, 2021

Deadline for abstract submission: 5th Oct, 2021



Anomalies 2021: Core team and control room (B-506)



DML@LHC-2022: a change of pace

No Anomalies in 2022.

Data and Machine Learning at the Large Hadron Collider (DML@LHC): specialized workshop organized from 22-28 August 2022.

Organized under the Karyashala programme of SERB.

Instructors:

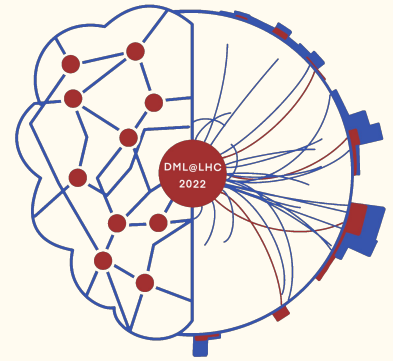
Aruna K. Nayak

Nishita Desai

Priyotosh Bandyopadhyay

Saranya Samik Ghosh

Satyaki Bhattacharya



Rebirth as
Phoenix
2023



Phoenix 2023

Back to offline again.

Partially supported by SERB.

In the era of LHC run 3 and the newer proposed colliders, anomalies are slowly going away.

PHOENIX: encompasses the **phenomenology** of **Dark Matter**, **Neutrinos**, various **extensions** and **interactions**, at different **energy** frontiers, with the help of present and future **colliders**.

Speakers include:

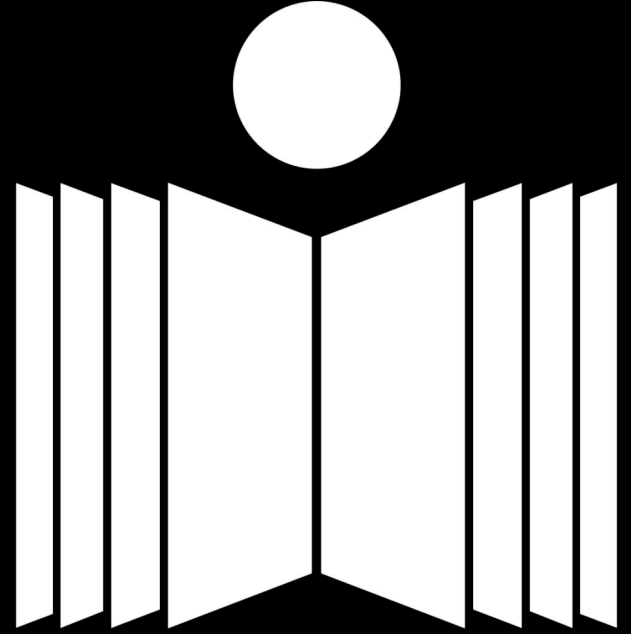
Eung Jin Chun
Mariana Frank
Rohini Godbole
Shrihari Gopalakrishna
Kajari Mazumdar
Et al.



Thrust Areas

Beyond the Standard Model
Present and Future Colliders
Astroparticle Physics and
Cosmology
Neutrino physics
Dark Matter

IITH,
at a glance



భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్

भारतीय प्रौद्योगिकी संस्थान हैदराबाद

Indian Institute of Technology Hyderabad

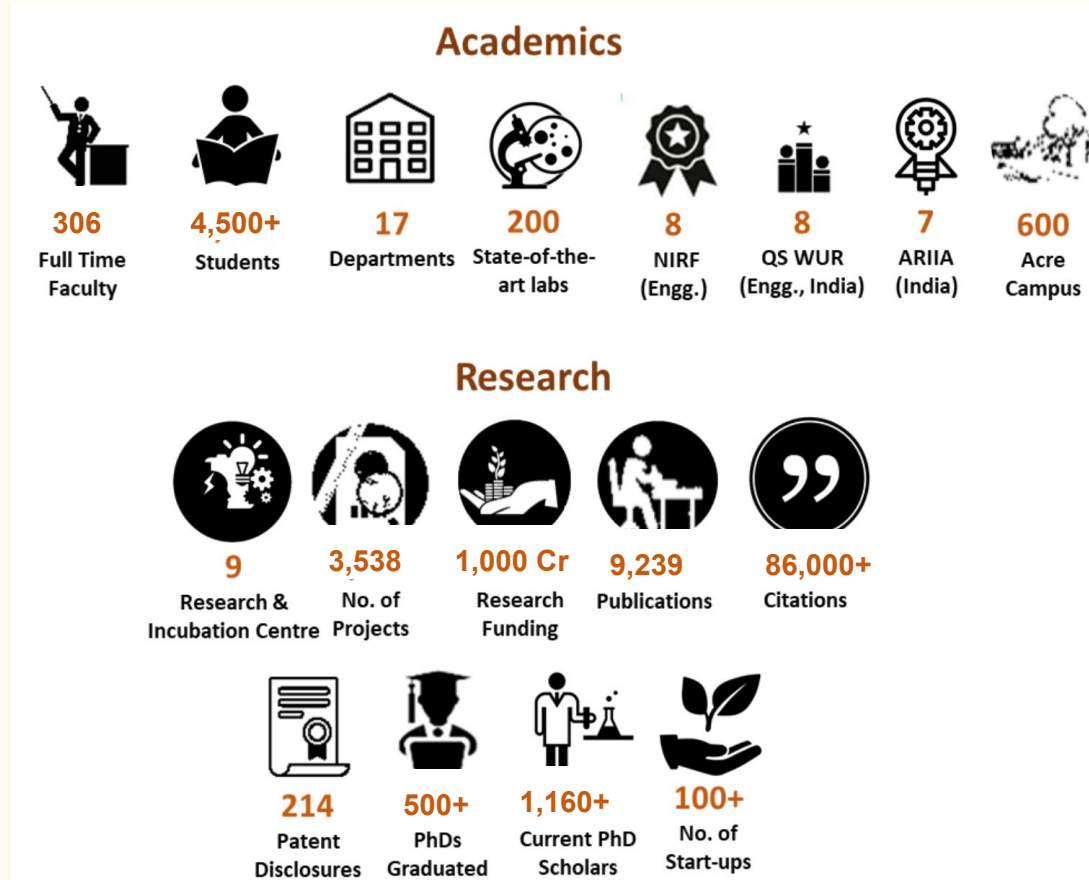
Indian Institute of Technology Hyderabad (IITH)

Indian Institute of Technology Hyderabad (IITH) was founded in 2008 and moved to the current campus in 2015.

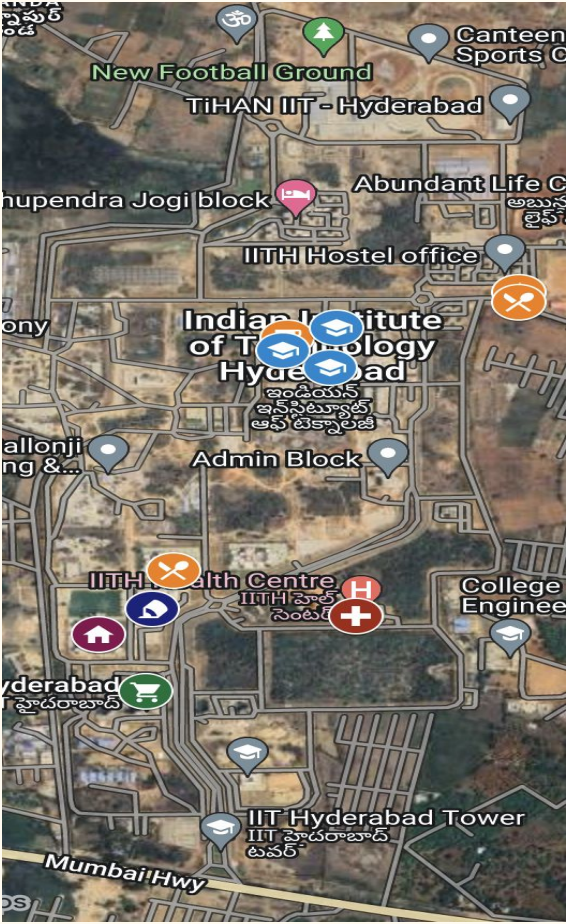
IITH has established itself as one of the premier institutes for science and engineering in India.

IITH has a strong focus on encouraging research and innovation.

IITH motto: *“Inventing and Innovating in Technology for Humanity”*



Indian Institute of Technology Hyderabad

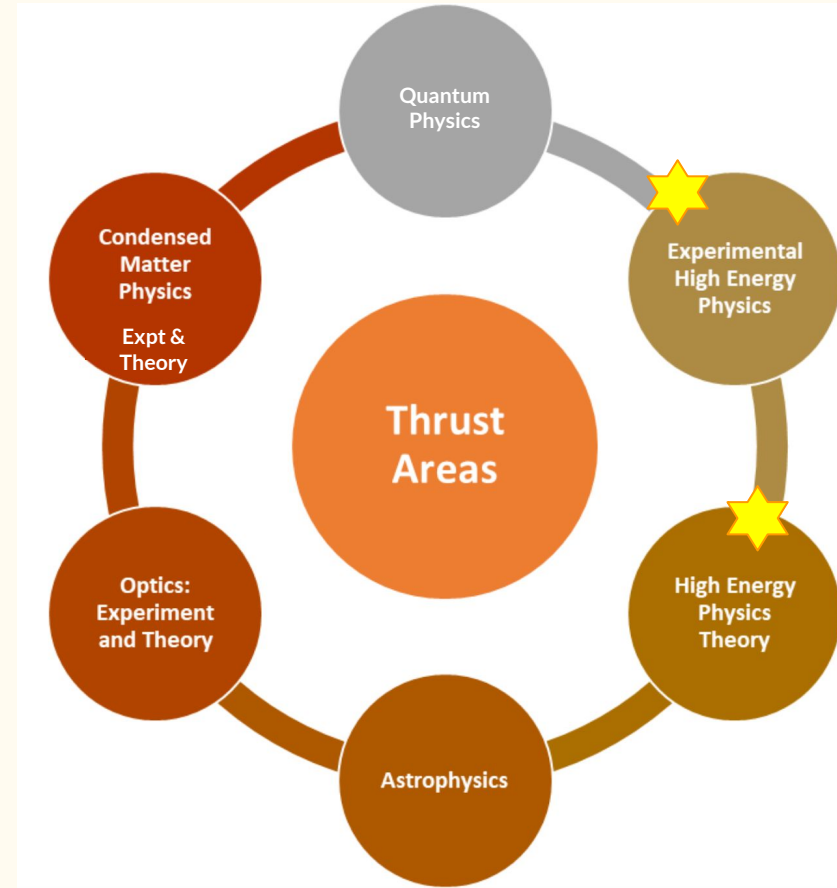


Department of Physics, IITH

29 faculty members working in the fields of:
high energy physics (experiment & theory),
astrophysics,
condensed matter physics (exp. & theory),
optics,
and quantum information.

Department has ~250 students including those pursuing B.Tech. in Engineering Physics, M.Sc. in Physics and Ph.D.

Department also conducts M.Sc. in Medical Physics and M.Tech. in Quantum & Solid State Devices.



Department of Physics, IITH



HEP @ Department of Physics, IITH

HEP Faculty
Theory/Pheno



Anjan Kumar Giri
Professor

Ph.D: Utkal University

- Flavor Physics and CP violation
- Neutrino Physics
- BSM



Narendra Sahu
Professor

Ph.D: IIT Bombay

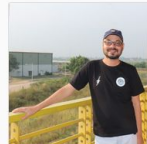
- Physics (Elementary Particle) phenomenology



Anurag Tripathi
Associate Professor

Ph.D: Harish-Chandra Research Institute

- High Energy Physics
- Perturbative Quantum Chromodynamics
- Infrared Structure of Gauge Field Theories



Priyotosh Bandyopadhyay
Associate Professor

Ph.D: Harish Chandra Research Institute, Allahabad (Homi Bhabha National Institute)

- LHC
- Higgs Physics
- Supersymmetry



Raghavendra Srikanth Hundi
Assistant Professor

Ph.D: Harish-Chandra Research Institute

- Physics beyond standard model
- Neutrino masses



Shubho Ranjan Roy
Assistant Professor

Ph.D: Brown University

- Nonperturbative String and Quantum Field theory
- AdS/CFT
- Quantum Black Holes



Saranya Ghosh
Assistant Professor



Saurabh Sandilya
Assistant Professor

HEP Faculty
Experiment

Adjunct
Faculty
members



Eric Laenen
Adjunct Professor



Eung Jin Chun
Adjunct Professor



Karim Trabelsi
Adjunct Professor



Mariana Frank
Adjunct Professor

Distinguished
faculty



Prof. Rohini M. Godbole
IISc, Bangalore
Distinguished Professor

Department of Physics, IITH : Collaborations

Belle and Belle II Collaborations

CMS Collaboration at CERN (in process)

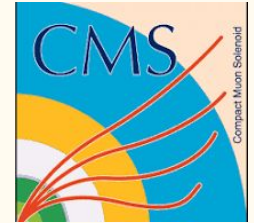
DUNE Experiment

NOvA Experiment

Also for Astrophysics:

Dark Energy Survey Collaboration

Indian Pulsar Timing Array Consortium



Phoenix 2023





Phoenix 2023

Department of Physics
IIT Hyderabad

భారతీయ ఇంజనీరింగ్ డిప్లొమా ఇంస్టిట్యూట్
భారతీయ ఇంజనీరింగ్ డిప్లొమా ఇంస్టిట్యూట్
Indian Institute of Technology Hyderabad

PHOENIX-2023

International Conference
(formerly known as Anomalies at IIT Hyderabad)

18 - 20 December, 2023

Indian Institute of Technology Hyderabad

Venue for conference:

Convention Center (CC)

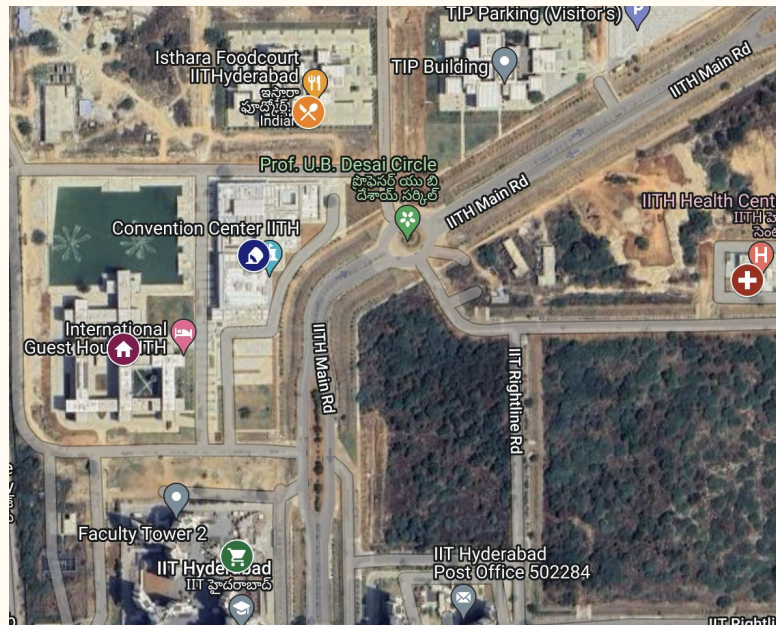
Plenary : CC2 at Conv. Center

Parallel: CC2, CC3

Stay:

All non-local participants are hosted
at the International Guest House (IGH)

Medical Center, Supermarket (Sampoorna),
ATM (SBI) within walking distance.



Food

During 18-20 December:

three lunches,

two regular dinners,

one Conference dinner

will be provided at the Upper Dining Hall, IGH.

Complimentary breakfast will be provided at the lower/upper dining hall, IGH for those staying.

Tea/Coffee and Snacks will be served at the Convention Center.

There is an Isthara Food Court within walking distance of the Convention Center with outlets such as Subway etc.



WiFi

At the Convention Center, for internet access:

Participants from IITH can use their regular IITH Wifi credentials.

Non-IITH participants can use:

SSID: IITH-Guest-PWD-IITH@2023

Password: IITH@2023

Eduroam Wifi is also available.

At IGH, please contact the reception for WiFi details.

Hope you enjoy the conference!

Mon 18/12

09:00	Inauguration	
	Convention Center CC2, IIT Hyderabad	09:00 - 09:30
	Bubble-assisted Leptogenesis	Eung Jin Chun
10:00	Convention Center CC2, IIT Hyderabad	09:30 - 10:15
	Thermal field theory of dark matter and thermal corrections to dark matter annihilation cross sections	D Indumathi
	Convention Center CC2, IIT Hyderabad	10:15 - 11:00
11:00	Tea Break	
	Convention Center, IIT Hyderabad	11:00 - 11:30
	Is light neutralino thermal DM ruled out in the PMSM?	Rohini Godbole
	Convention Center CC2, IIT Hyderabad	11:30 - 12:10
12:00	Diphoton jets to probe light fermiophobic Higgs boson signals at the HL-LHC	Prof. Jeonghyeon Song
	Convention Center CC2, IIT Hyderabad	12:10 - 12:50
13:00	Lunch Break	
14:00	IGH, IIT Hyderabad	13:00 - 14:30
14:00	Bubble dynamics of first order electroweak phase transitions	Luigi Delle Rose
	Convention Center CC2, IIT Hyderabad	14:30 - 15:00
15:00	Neutrino Mass Models: Roadmap for Collider and Cosmology	Minimata Miba
	Convention Center CC2, IIT Hyderabad	15:00 - 15:30
	Probing Dark Matter Interactions in the Light of CMBR	Avinand Chatterjee
	Convention Center CC2, IIT Hyderabad	15:30 - 16:00
16:00	Tea Break	
	Convention Center, IIT Hyderabad	16:00 - 16:30
	Thermalized One-Loop In-medium Baryon resonances in $\text{Sp}(4)_N$ S matter	Pallavi Kalkiyoti
	Convention Center CC2, IIT Hyderabad	16:30 - 17:00
17:00	Exotic Particles at LHC and Future Colliders	niranjana kumar
	Convention Center CC2, IIT Hyderabad	17:00 - 17:30
	Relic Density Aspects of a Boosted Light Dark Matter Scenario	Sounya Sadhukhan
	Convention Center CC2, IIT Hyderabad	17:30 - 18:00
18:00	SW-Smass and lepton $\text{Sp}(2)$ in extended inert 2HDM	Hrishabh Bhardwaj
	Convention Center CC2, IIT Hyderabad	18:00 - 18:30

Tue 19/12

09:00	Should we consider scalar extensions seriously?	Anshu Kundu et al.
	Convention Center CC2, IIT Hyderabad	09:00 - 09:45
	Baryon Asymmetry from a Majorana Fermion Pair Coupled to Quarks	Shefali Gopalakrishna
	Convention Center CC2, IIT Hyderabad	09:45 - 10:30
	Tea Break	
	Convention Center, IIT Hyderabad	10:30 - 11:00
11:00	Wave-Packet Effects: A Solution for Isospin Anomalies in Vector-Meson Decay	Kerly Nishiwaki
	Convention Center CC2, IIT Hyderabad	11:00 - 11:30
	Some aspects of deep learning frontier in THEP	Partha Konar
	Convention Center CC2, IIT Hyderabad	11:30 - 12:00
12:00	TBA	Kiriman Ghosh
	Convention Center CC2, IIT Hyderabad	12:00 - 12:30
	Universal See-Saw in Left-Right Symmetric Models	Dr Santosh Rai
	Convention Center CC2, IIT Hyderabad	12:30 - 13:00
13:00	Lunch Break	
14:00	IGH, IIT Hyderabad	13:00 - 14:30
	Cosmionization and scotogenic fermionic dark matter	Search for light long-lived particles at future colliders Dr Nivedita Ghosh
	Arinban Karan	
15:00	Quantum Spread Complexity in Neutrino Oscillations	SMEFT analysis of charged lepton flavor violating SBS... Dr Joydeep Roy
	Dr Khushboo Dutt	
	Multi-Component Dark Matter: Identifying at Collider	Dynamic Radius Jet Clustering Algorithm Dr Tousef Sami Dr Punjot Singh
	Dr Tousef Sami Dr Punjot Singh	15:10 - 15:30
	Constraining New Physics with Possible DM Signatures fr...	The Hunt for Non-Resonant Signals of Axion-Like Partic... Tisa Biswas
	M.Lipika Koley	
	Light Dirac neutrino portal dark matter with gauged B-L e...	Interplay of Inert Higgs Doublet and Vector Like lepton in... CHANDRIMA SEN
	Nayan Das	
16:00	Tea Break	
	Convention Center, IIT Hyderabad	16:00 - 16:30
	Phenomenology of an asymmetric Scotogenic model	Signatures of the inert triplet model from vector boson fa... Snehasri Parashar
	Noel Jobu	
	Exploring Sub-GeV Dark Matter Boosted by Diffuse Super...	Next-to-minimal Vectorlike Quark models at the LHC: Be... Cyril Neesaj
	Mr Arinban Majumdar	
17:00	Majorons Revealed: light dark matter as FIMP	Searching for effects beyond SMEFT in flavour physics Mr Siddhartha Kamakar
	Soumen Kumar Manna	
	Phenomenology of Dirac Scotogenic Model	Large lepton number violation at colliders in linear seesaw Praveen Bhardwaj
	Mr Sushant Yadav	
	The dynamics and detection possibility of a pseudo-FIMP...	Boosted Top Tagging through Flavour-violating Interact... Shreecheta Choudhury
	Mr Dipankar Pradhan	
	TBA	Saurabh Myer
	Convention Center CC2, IIT Hyderabad	17:45 - 18:00
18:00	Conference Dinner	
	Indian Institute of Technology Hyderabad	19:30 - 21:30

Wed 20/12

09:00	Dark Matter and Collider Signals in the Alternative Left-Right Model	Mariana Frank
	Convention Center CC2, IIT Hyderabad	09:00 - 09:45
	Status of the LHC and Standard Model Physics	Kajal Mazumdar
	Convention Center CC2, IIT Hyderabad	09:45 - 10:30
	Tea Break	
	Convention Center, IIT Hyderabad	10:30 - 11:00
11:00	Recent results on BSM searches at LHC	Aruna Nayak
	Convention Center CC2, IIT Hyderabad	11:00 - 11:30
	Constraints on doublet left-right symmetric model from Higgs data	Sankagiri Umastankar
	Convention Center CC2, IIT Hyderabad	11:30 - 12:00
12:00	Connecting Dark Matter with flavor puzzle	Rishi Mandal et al.
	Convention Center CC2, IIT Hyderabad	12:00 - 12:30
	Nonlocal Cosmologies from the Chiral-conformal Anomaly Effective Action and Einstein-Gauss Bonnet	Claudio Coriano
	Convention Center CC2, IIT Hyderabad	12:30 - 13:00
13:00	Lunch Break	
14:00	IGH, IIT Hyderabad	13:00 - 14:30
	Self-interacting dark matter and the GRB221009A event	Leptogenesis and Dark Matter Through Relativistic Bubb... Indrajit Saha
	Vicky Singh Thounsojam	
	Singlet-doublet fermion dark matter with Dirac neutrino m...	Complementary Probe of Beyond the Standard Model Ph... Sujit Kumar Sahoo
	Dr Joydeep Roy	
15:00	Constraining an extra dimensional U(1)_L - Ltau model	Astrophysical Q-balls and their gravitational microlensin... Mr Dipyendu Chatterjee
	Mr Dipyendu Chatterjee	
	Realizing Electroweak Baryogenesis in connection to dar...	Gravitational wave imprints of the doublet left-right sym... Mr Dhruv Ringe
	Dipendu Bhandari	
	Thermal correction to Dark matter annihilation processes	Spinning Primordial Black Holes from First Order Phase ... Indra Kumar Banerjee
	Mr Pratik Bhowik	
	Radiative Corrections to the Direct Detection of the Higgs...	Probing photon-axion-like particle (ALP) oscillations fro... Shashi Prakash Puri
	Syed Asif Pasha	
16:00	Tea Break	
	Convention Center, IIT Hyderabad	16:00 - 16:30
	Neutrino Mass Sum Rules from Modular Smathcal{A}_4 S...	Scotogenic $\text{SU}(3)_c \times (\text{mu})_L \times (\text{tau})_R$ origin of $\text{Sp}(2)_L$ m... Mr Ranjeet Kumar
	Mr Ranjeet Kumar	
	Viability of Boosted Light Dark Matter in a Two-component...	Exploring Prospects on an U(1) _L - Ltau Extra Dimen... Arindam Basu
	Arindam Basu	
17:00	Probing Dark Matter-Electron Interactions in the Cosmic ...	Leptogenesis studied in left-right symmetric model with ... Ankita Kakoti
	Rahul Dnyan	
	Exploring Axions through the Photon Ring of a Spherical...	Exploring a Novel Dark Hyper Charge Model. Mr Hemant Kumar Prigodak
	Pratik Sarker	
	Closing Remarks	
	Convention Center CC2, IIT Hyderabad	17:30 - 18:00
18:00		