

# Our Team

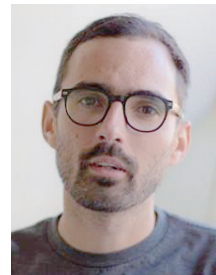
## Rodrigo Alonso

Research Field: **Theoretical Physics**

Postdoc

The core of my research is the search for a fundamental origin of mass. This has taken me through a number of fields i) electro-weak symmetry breaking with emphasis on Higgs properties, ii) the mass and mixing structure in the three generations of matter, iii) the quest for the discovery of dark matter, and iv) the contribution of gravity to the masses of Nambu-Goldstone bosons. The focus of my work is

on testability, generality and simplicity.



## Pietro Caradonna

Research Field: **Experimental Physics**

Postdoc

I joined Professor Takahashi's group at Kavli-IPMU, specifically to participate in the design and development of a gamma-ray camera that can image cancer stem cells in-vivo.

My investigations are naturally leading me towards the fundamental aspects of particle physics, and my future plan is to develop novel methods of applying Compton cameras in this area. Indeed, the theoretical community at Kavli IPMU is an ideal place to explore

such ideas and I plan to take full advantage of my time at Kavli IPMU.



## Thomas Rafael Czank

Research Field: **Experimental Physics**

Postdoc

During my PhD studies at Tohoku University I joined the Dark Sector group of the Belle collaboration. We pursued a search for a new U(1) gauge boson,  $Z'$ , which gauges lepton number differences. Besides its connection to sterile neutrinos, it was expected that it could also make a contribution to the magnetic moment of the muon anomaly due to its coupling to muons. With Belle 2's record sensitivity and data samples on the horizon I am still interested in other



dark sector candidates along with rare decay modes within the Standard Model, which demand more elaborate analysis strategies.

## Lalitwadee Kawinwanichakij

Research Field: **Astronomy**

Postdoc

I am interested in studying the formation and evolution of galaxies using observational data. My recent work focuses on the effect of the local environment of galaxies on their star-formation and using satellite galaxies to probe feedback mechanisms in galaxy evolution.

At Kavli IPMU, I utilize the HSC survey to measure the build-up of galaxies across the full range of environments. My goal is to separate the effects



of processes associated with halo mass from those associated with the large-scale environment on the galaxy star formation.

## Keigo Nakamura

Research Field: **Experimental Physics**

Postdoc

I worked on the T2K long baseline neutrino oscillation experiment to explore CP violation in the lepton sector. In particular, I contributed to the development of the J-PARC accelerator and neutrino beam line, and oscillation analysis.

At the Kavli IPMU, I will try to develop the Prime Focus Spectrograph (PFS) of the Subaru Telescope. I want to explore the properties of dark energy and



dark matter, and to measure the neutrino mass with PFS.

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## Ipsita Saha

Research Field: **Theoretical Physics**

Postdoc

My main focus of research lies in studying the phenomenology of beyond the Standard Model physics in the post Higgs discovery era. Specifically, I am interested in finding the Higgs and electroweak symmetry breaking properties of models based on gauge and scalar sector extension of the SM. I have worked on the detection prospect of such models at the recent LHC and future high energy colliders. I would like to continue research in this direction. I have also worked on Dark Matter models in the light



of various direct and indirect dark matter detection experiments. My current interest involves the detection possibility of such Dark Matter scenarios at the current and future colliders.

## John Welliaveetil

Research Field: **Mathematics**

Postdoc

My research interests lie in the field of non-Archimedean geometry which has seen a lot of activity in recent years. I work on the homotopy theory of certain Berkovich analytic spaces and on the étale cohomology of finite type, separated adic spaces. Recently, I have tried to study the extent to which the constructions of Hrushovski-Loeser in the book “Non-archimedean tame topology and stably dominated types” can be made functorially. Another



project I am very interested is inspired by ideas of Peter Scholze and aims to develop a theory of perverse sheaves in the context of adic spaces.