



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

COLLOQUIA DFA A.A. 2025/26



Dipartimento
di Fisica
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Galileo Galilei



COLLOQUIUM DFA

OCTOBER 2ND 2025 - 3 PM

AULA ROSTAGNI
YOUTUBE STREAMING

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When a Symmetry Breaks

Abstract: What is common among a magnet, a halibut, a rack of laundry, cubes of ice, superconductor, and the Higgs boson? The concept of spontaneous symmetry breaking is a common theme for many natural phenomena. I'll describe the basic concept and its applications. In particular, the original concepts from Anderson, Nambu, Goldstone, and Higgs do not quite work in many systems that include a magnet on your fridge. I generalize the concept so that it is applicable to all known natural phenomena around us.

Prof. **Hitoshi Murayama** is a theoretical physicist whose research spans particle physics and cosmology. He has made key contributions in areas such as physics beyond the Standard Model, quantum field theory, collider physics, dark matter, dark energy, inflation, grand unification, and neutrino physics, among others. He received his PhD in physics from the University of Tokyo, then pursued postdoctoral research at Lawrence Berkeley National Laboratory before joining the faculty at the University of California, Berkeley, where he is now a professor of physics. In 2007, he became the founding director of the Kavli Institute for the Physics and Mathematics of the Universe (IPMU) at the University of Tokyo, establishing it as a hub for international and interdisciplinary research. Murayama has also served in leading roles on major scientific collaborations and advisory boards. His achievements have been recognized with honors including the Nishina Memorial Prize, election as a Fellow of the American Physical Society, and the Breakthrough Prize in Fundamental Physics as a member of the KamLAND collaboration.



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