

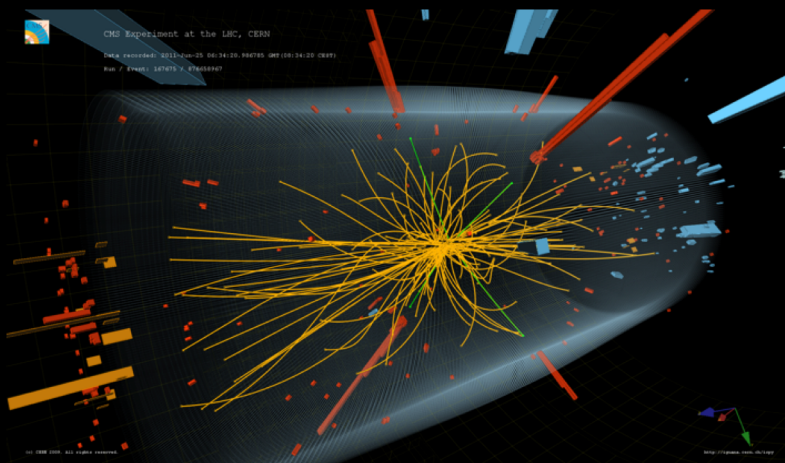
# The KIT Center Elementary Particle and Astroparticle Physics KCETA

Anke-Susanne Müller, KCETA Spokesperson

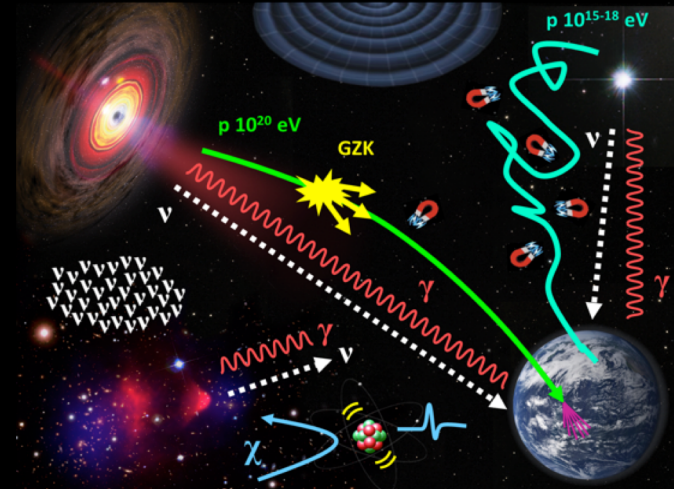


# KCETA: What we do

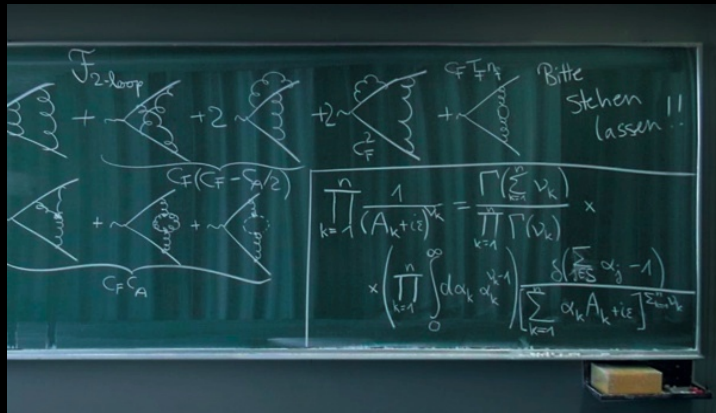
- KCETA fosters experimental and theoretical research and education at the interface between astroparticle physics, elementary particle physics and cosmology, and related technologies.
- KCETA builds on the successful tradition that has been lived for many years in particular in the Center of Excellence for Particle and Astroparticle Physics CETA and in the doctorate school KSETA.
- KCETA engages in large-scale international projects for knowledge-driven fundamental research – with a 360° view covering the entire value chain.
- KCETA is a platform for mutual science, enabling trustful exchange in a protected space and thus paving the way for new ideas and projects.



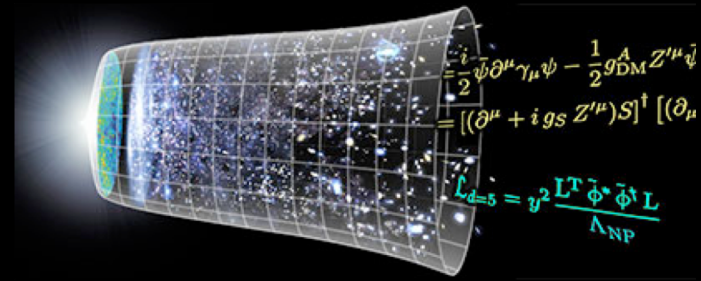
# Experimental Particle Physics



# Experimental Astroparticle Physics



# Theoretical Particle Physics



# Theoretical Astroparticle Physics

# KCETA covers the entire value chain.....

experimental and theoretical  
particle/astroparticle physics



applied physics, engineering &  
research in technologies



*prototype KCETA alumni....?*



# KCETA Research Topics

## Astroparticle Physics

Cosmic Rays

Dark Matter Searches

High-energy Neutrino-Astronomy

Astroparticle Theory

## Experimental Particle Physics

Neutrino Physics

Experimental Collider Physics

Flavor Physics

## Accelerator Physics

## Theoretical Particle Physics

Theoretical Collider Physics

Quantum Field Theory

Flavor Physics

## Sensors, Detectors, Electronics

## Computing, Data Science, GridKa

# Large-scale Experiments & Collaborations



KATRIN



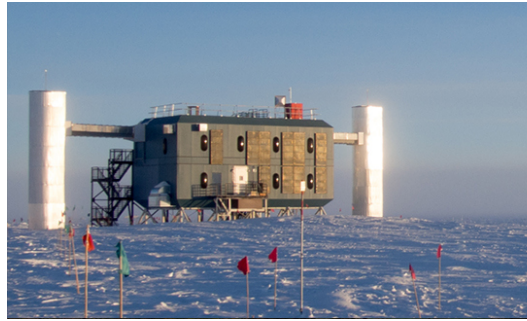
XENONnt



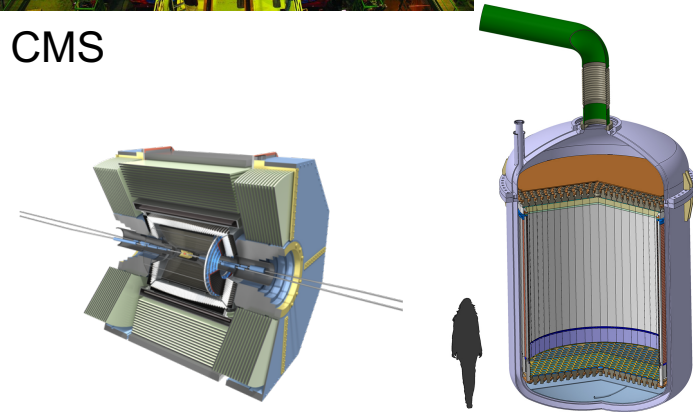
CMS



Pierre Auger Observatory



IceCube Observatory



BELLE II

DARWIN



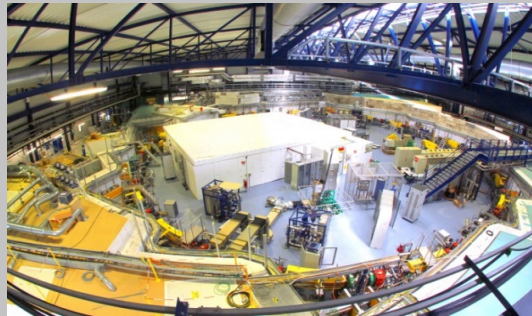
# Research infrastructure and facilities



Grid Computing Center  
Karlsruhe (GridKa)



Tritium Laboratory  
Karlsruhe (TLK)



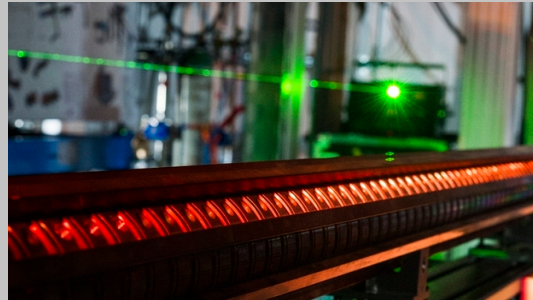
Karlsruhe Research Accelerator (KARA)



ASIC- and Detector Laboratory



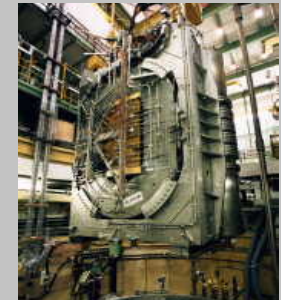
Irradiation center/ cyclotron



Far infrared Linac- and test experiment (FLUTE)



Clean room for production of  
superconductive sensors



Superconductive magnet  
test facility

# KCETA at KIT – The Research University in the Helmholtz Association

Cryo  
technology

GridKa

Sensor and  
detector development

Five Discipline-oriented  
**Divisions**

**Division I**  
Biology, Chemistry  
and Process  
Engineering

**Division II**  
Informatics,  
Economics  
and Society

**Division III**  
Mechanical  
and Electrical  
Engineering

**Division IV**  
Natural and Built  
Environment

**Division V**  
Physics and  
Mathematics

Eight Interdisciplinary  
**KIT Centers**



Energy



Information  
Systems  
Technologies



Mobility  
Systems



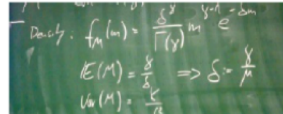
Elementary  
Particle and  
Astroparticle  
Physics



Climate and  
Environment



Materials



Mathematics in  
Sciences, Engineering,  
and Economics



Humans and  
Technology



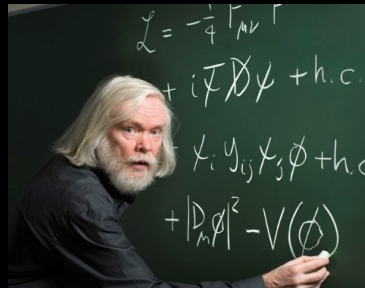
# Karlsruhe Graduate School for Elementary Particle Physics and Astroparticle Physics: Science and Technology







Frank Wilczek  
2008



Jonathan Ellis  
2009



Valery Rubakov  
2010



Guido Altarelli  
2011



Peter Jenni und Michel Della Negra  
2012



Takaaki Kajita  
2013



Arkady Vainshtein  
2014



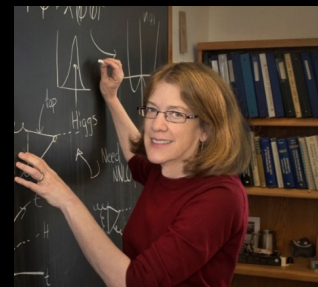
Lisa Randall  
2015



Robert Klanner  
2016



Francis Halzen  
2017



Sally Dawson  
2018

<b>16:00</b>	→ 16:10	<b>Welcome</b> Speaker: Thomas Hirth (Karlsruher Institut für Technologie)	🕒 10m
<b>16:10</b>	→ 16:20	<b>Introduction to the KIT Centre Elementary Particle and Astroparticle Physics (KCETA)</b> Speaker: Anke-Susanne Müller (KIT)	🕒 10m
<b>16:20</b>	→ 16:50	<b>The Unreasonable Effectiveness of Quantum Field Theory</b> Speaker: Martin Beneke (TUM)	🕒 30m
<b>16:50</b>	→ 17:00	<b>Art contribution of SAM•ComputerStudio and IMWI of the Karlsruhe University of Music</b>	🕒 10m
<b>17:00</b>	→ 17:15	Coffee break	🕒 15m
<b>17:15</b>	→ 17:45	<b>Laudation</b> Speaker: Ulrich Nierste (Institut fuer Theoretische Teilchenphysik, KIT CS)	🕒 30m
<b>17:45</b>	→ 17:55	<b>Presentation of the Julius Wess Award</b> Speaker: Thomas Hirth (Karlsruher Institut für Technologie)	🕒 10m
<b>17:55</b>	→ 18:00	<b>Art contribution of SAM•ComputerStudio and IMWI of the Karlsruhe University of Music</b>	🕒 5m
<b>18:00</b>	→ 19:00	<b>Approximate symmetries of the Standard Model for elementary particle interactions and their implications for the hadronic spectrum, proton decay and cosmology</b> Speaker: Prof. Mark Wise (Caltech)	🕒 1h
<b>19:00</b>	→ 20:00	Reception	🕒 1h