

# **CORSIKA Cosmic Ray Simulation Workshop Karlsruhe**



**Monday, June 17, 2019 - Thursday, June 20, 2019**

**Hotel ACHAT PLAZA Karlsruhe**

## **Scientific Program**

The simulation of cosmic ray extensive air showers is of central importance for astroparticle physics. At this workshop we discuss the state-of-the-art of such simulations, open questions and steps towards modern and new simulation approaches. The CORSIKA 8 Project is the ongoing software upgrade of the CORSIKA program. We will talk about ongoing work and the status of CORSIKA 8.

Experimental collaborations and theorists/phenomenologist are invited and asked to provide input and describe current and future opportunities and challenges.

## **30 years of CORSIKA celebration**

CORSIKA was first developed as COsmic Ray Simulations for the KAScade experiment. While KASCADE as experiment has been decommissioned, CORSIKA continues to thrive on its own for a much longer time to come. The original first version of CORSIKA was released in 1989 - 30 years ago! It is a tremendous success that CORSIKA was constantly maintained and further developed over all these years at KIT, to a large extent by Dieter Heck. Of course many people are behind the enormous success of CORSIKA and we want to celebrate this in June 2019.

## **Requirements and further input**

We ask for contributions from experiments, applications by observatories, theorists and phenomenologist to describe their requirements and wishes. The purpose of this is to identify common needs and the optimal functionality of the CORSIKA 8 project. We are still in a phase of almost full flexibility in CORSIKA 8 and can extend and fine-tune its capabilities in a wide range. It is our goal to provide the best possible tool for particle cascade simulations in astroparticle physics.

## **Status and progress of air shower simulations**

The active development on CORSIKA 8 started in summer 2018. We have seen a lot of contributions and tremendous progress during the last months. The main goal have been published in a white paper, and it is important to review the actual design decisions and implementations. CORSIKA 8 is about to enter in a transition phase where we will move from almost pure "framework implementation" towards a much more physics driven development. We will have to start to include and provide the best possible physics for hadrons, electrons, photons and muons from below MeV to above EeV energies. The baseline physics is all available in CORSIKA 7, and this is our ultimate benchmark.