

## **Abstract**

Oberwolfach Workshop:

### **Mathematical General Relativity**

Dates:

**5 Aug - 11 Aug 2018** (Code: 1832)

Organizers:

**Carla Cederbaum, Tübingen**

**Mihalis Dafermos, Princeton**

**Jim Isenberg, Eugene**

**Hans Ringström, Stockholm**

In 2015, the scientific community celebrated the centennial of Einstein's final formulation of the field equations of general relativity. On September 14, 2015, what may be remembered as one of the great milestones of 21st century science was achieved: the direct detection of gravitational waves, believed to be a signal from the merger of a binary black hole system. Contemporaneously with these monumental developments on the observational side, the study of mathematical aspects of general relativity is itself undergoing a true renaissance. Indeed, as the GR centennial celebrations are winding down, we find that a number of fundamental open theoretical problems concerning black holes and cosmology are now at the threshold of being resolved, and researchers are now aiming to tackle increasingly ambitious goals. Recent mathematical work in GR has achieved a high profile in a wide variety of areas of mathematics, including differential geometry, partial differential equations, global analysis and dynamical systems. It is also playing an increasingly important role in several areas of physics, including astrophysics, cosmology, high energy physics, and numerical simulations. To a large extent, the exciting strides which have recently occurred in mathematical GR, along with its growing influence, have been led by a new generation of young mathematicians who combine technical power and a broad scientific outlook. In view of these developments, we expect our proposed meeting to be perhaps the most exciting yet in this series! We review below some of the very recent developments in the field.