Gravitational Lensing in the Kerr Spacetime Geometry

organized by
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Workshop Summary

The workshop began with an overview of the problem presented by Dr. Arlie Petters that included a detailed discussion of the Kerr spacetime geometry and the basic assumptions and definitions for the case of lensing by a thin lens. The rest of the workshop was divided into AM and PM session with a half hour recap/discussion session at the start each day. A detailed schedule of talks is given at the end of this report.

The workshop can be broadly divided into three main parts:

I. **Detailed Analysis of Kerr and Spinning Lenses**

Ia: **(V. Bozza and M. Sereno)**
- Full calculations for non-equatorial case
- Are there ways in which calculations will lend themselves to observational work? i.e., Observables
- Self-lensing of Sgr A*

Ib: **(A. Zakharov)**
- Inferring spin from shadow
- Accretion disk
- Tests of GR Observables

II. **Numerical and Observational Work (K. Rauch and W. Cash)**
- Lightcurve plotting, ray tracing, orbits
- Gravitational Redshifts
- Doppler Shifts
- Magnification, Images, Time delay
- MAXIM

III. **Mathematical Foundation (A.O. Petters, E.T. Newman, V. Perlick)**
- Topology
- Invariants
- Kerr Black Holes