



東工大 基礎・物性物理学専攻「魅力ある大学院教育イニシアティブ」
FGIP: Foreign Graduate Student Invitation Program
外国人博士課程大学院生の短期招待・共同研究
FGIP-Student Forum セミナー

Tobias Westphal

(Albert Einstein Institute, University of Hannover, Germany)

日時: 2012年10月19日(金) 14:00~15:00

場所: 本館 H155B

AEI 10m Prototype Interferometer

Abstract:

Gravitational-waves, a consequence of the theory of general relativity, are ripples in the fabric of space-time itself. Only the most violent processes in the Universe can generate gravitational-waves of a strength that will make their detection feasible. Among these events are the collision of black holes or neutron stars, as well as supernova explosions. The detection of gravitational-waves will open a new and complementary window to the universe, through which these processes will be made visible. Gravitational-wave detection will eventually also shed light on matter and processes that do not interact with electromagnetic waves at all, i.e. dark matter may be able to become directly observable. While the first generation of gravitational-wave detectors did not yet find these waves, the second generation of detectors is anticipated to make regular detections.

In order to build even more sensitive instruments that would allow full astrophysical analysis of the underlying events it is mandatory to develop and proof the required techniques and technology. A 10m prototype interferometer is currently being set up at the Albert Einstein Institute (AEI) in Hannover, Germany. It aims at measuring and even surpassing the standard quantum limit of interferometry. Many of the techniques required to perform this experiments are relevant for the coming generations of gravitational-wave detectors. Among these techniques are low-frequency seismic isolation, well stabilized high-power laser, digital data acquisition and control infrastructure, ultra-low loss monolithic mirror suspensions, and marginally stable Fabry-Perot cavities for the reduction of thermal noise.

In this talk I will give an overview about gravitational-wave physics and report about our experimental facility.

教員、修士課程大学院生の参加も歓迎します。

担当 須佐友紀 (内線3639)



FGIP-Guest student の滞在スケジュール

名前	大学・研究機関	滞在期間	受入担当
Tobias Westphal	AEI, University of Hannover, Germany	10/1 - 10/27	須佐友紀