



# SCIENTIFIC AND PEDAGOGICAL INTERNSHIP IN THE EUROPEAN INSTITUTE FOR INNOVATION DEVELOPMENT

Introduction.

Part Two.

Czech Academy of Science: Modernity

# INTRODUCTION IN INTERNSHIP

## CAS Research Areas

### Area 1. Mathematics, Physics, and Earth Sciences

#### 1. Section of Mathematics, Physics, and Computer Science

Research in physics covers a broad spectrum of problems ranging from the basic constituents of matter and fundamental laws of nature to the detection and processing of experimental data from large accelerators. It also includes high-pressure, low-temperature, plasma and condensed matter physics, non-linear optics, and nuclear physics of low and medium energies. Astrophysical research is primarily concerned with solar physics, solar flares, dynamics of solar system bodies, and the formation of stars and galaxies.

The realm of mathematics and computer science covers highly abstract disciplines such as logic and topology, differential equations and their numerical solutions and statistical methods. Even the purely theoretical investigation of neural networks, optimization and numerical modelling is frequently motivated by concrete problems of the natural sciences with applicable results.

The section is comprised of six institutes which have a total of about 1900 employees, of whom about 1150 are graduate research workers

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Institutes:

Astronomical Institute of the CAS

Institute of Physics of the CAS

Institute of Mathematics of the CAS

Institute of Computer Science of the CAS

Nuclear Physics Institute of the CAS

Institute of Information Theory and Automation of the CAS

# INTRODUCTION IN INTERNSHIP

## CAS Research Areas

### Area 1. Mathematics, Physics, and Earth Sciences

### 2. Section of Applied Physics

In this section, the investigation of macroscopic properties and new structures of solid, liquid and plasma bodies is based on basic laws of physics. Detailed investigation of microstructures and microprocesses helps to solve problems of material science, such as the mechanics and dynamics of defects, composites, and structures and biomechanics. Modelling of spatially highly structured flows of various fluids, investigation of hydrodynamics of the biosphere, and plasma processing is also often target-oriented. High-temperature plasma research mainly includes pulsed power systems and problems of confinement and heating of a plasma in tokamaks.

Research in applied physics is often interdisciplinary and finds application in various science and technology areas. For example, synthesis of highly natural and intelligible Czech speech is an important goal of digital signals processing. Unique techniques are used also in the spectroscopy and electron microscopy of living objects. The section is comprised of six institutes which have a total of about 920 employees, of whom about 580 are graduate research workers.

# GENERAL INFORMATION

Full version of this presentation is available for review  
to the participants of the internship

