

Helmholtz International Research School for Teratronics

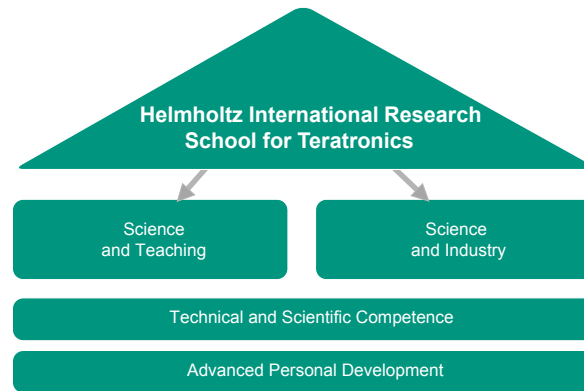
Teratronics is a multidisciplinary field embracing key aspects of optics and photonics, high-frequency electronics, and high-throughput digital signal processing. Teratronic systems are characterized by an intimate and inseparable co-integration of photonic components, millimeter-wave circuits, and digital elements.

The Helmholtz International Research School for Teratronics (HIRST) pursues a new approach in research and teaching which constitutes an interdisciplinary link among the traditional disciplines of physics, material science, electrical engineering, and computer science. HIRST offers a training program that enables next-generation researchers to explore the immense potential of Teratronics.



The PhD Program

HIRST has developed and implemented a novel PhD program, combining fundamental concepts of integration technologies and large-scale photonic-electronic integration with aspects of system integration and engineering and application-specific knowledge in high-speed communications and terahertz signal processing. These skills cannot be acquired in the framework of any of the classical academic disciplines.



There are many reasons why you should choose HIRST as the institution for doing your PhD: The excellent research environment and the school's outstanding reputation for producing internationally leading research results are just a few of those many reasons that could be mentioned.

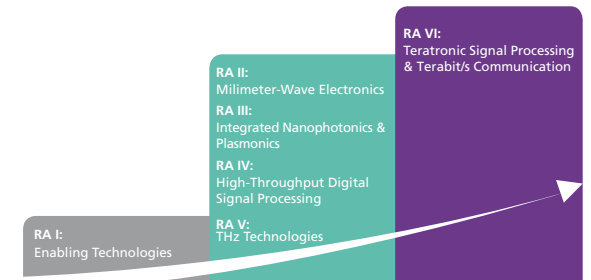
Graduate students prepare for a career in academic or industrial research and management, by building up specific technical key competences and soft skills along with strong international networks.

Scientific Objective

The field of Teratronics comprises methods and technologies that are needed to generate, process, and characterize terabit/s data streams and electromagnetic waveforms with terahertz bandwidths or carrier frequencies. Teratronics systems are used for terabit/s data communications, processing of waveforms with THz bandwidth, and exploitation of such waveforms in metrology and sensing technology. HIRST offers a multidisciplinary training program that establishes interdisciplinary crosslinking in the thinking of the involved PhD researchers. Research within HIRST are structured along the complete innovation chain of Teratronics, ranging from material science and enabling technologies to teratronic signal processing and terabit/s communications.

The six Research Areas are:

- RA I: Enabling Technologies
- RA II: Millimeter-Wave Electronics
- RA III: Integrated Nanophotonics & Plasmonics
- RA IV: High-Throughput Digital Signal Processing
- RA V: THz Technologies
- RA VI: Teratronic Signal Processing and Terabit/s Communication



Key Facts

- Three-year PhD-program
- Interdisciplinary, international network
- Development of professional and personal competence through
 - Technical modules
 - Management modules
 - International conferences
 - Individual mentoring program

Target Group

Applicants with a Master's degree or equivalent qualification in physics, electrical engineering, computer science, or optics & photonics.

Research Areas

RA I: Enabling Technologies

RA II: Millimeter-Wave Electronics

RA III: Integrated Nanophotonics & Plasmonics

RA IV: High-Throughput Digital Signal Processing

RA V: THz Technologies

RA VI: Teratronic Signal Processing Terabit/s and Communication

Applications possible at all times.
Please visit www.teratronics.kit.edu for more information.

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Supported by:



Multidisciplinary PhD Program in Teratronics

HELMHOLTZ INTERNATIONAL RESEARCH SCHOOL FOR TERATRONICS (HIRST)

