color meets flavor

Intelligent Hardware Lab

TA1 Kick-off meeting

Nov. 14, 2026

Jochen Dingfelder

UNIVERSITÄT BONN

technische universität dortmund

UNIVERSITÄT SIEGEN

JÜLICH Forschungszentrum

Intelligent Hardware Lab (IHL)

Cooperation Partner

Fachhochschule Dortmund
Integrated Circuit Design Laboratory

INTELLIGENT HARDWARE LAB

IHL LEADER

4 RESEARCH FELLOWS

Industry Partner

Cologne Chip

FTD

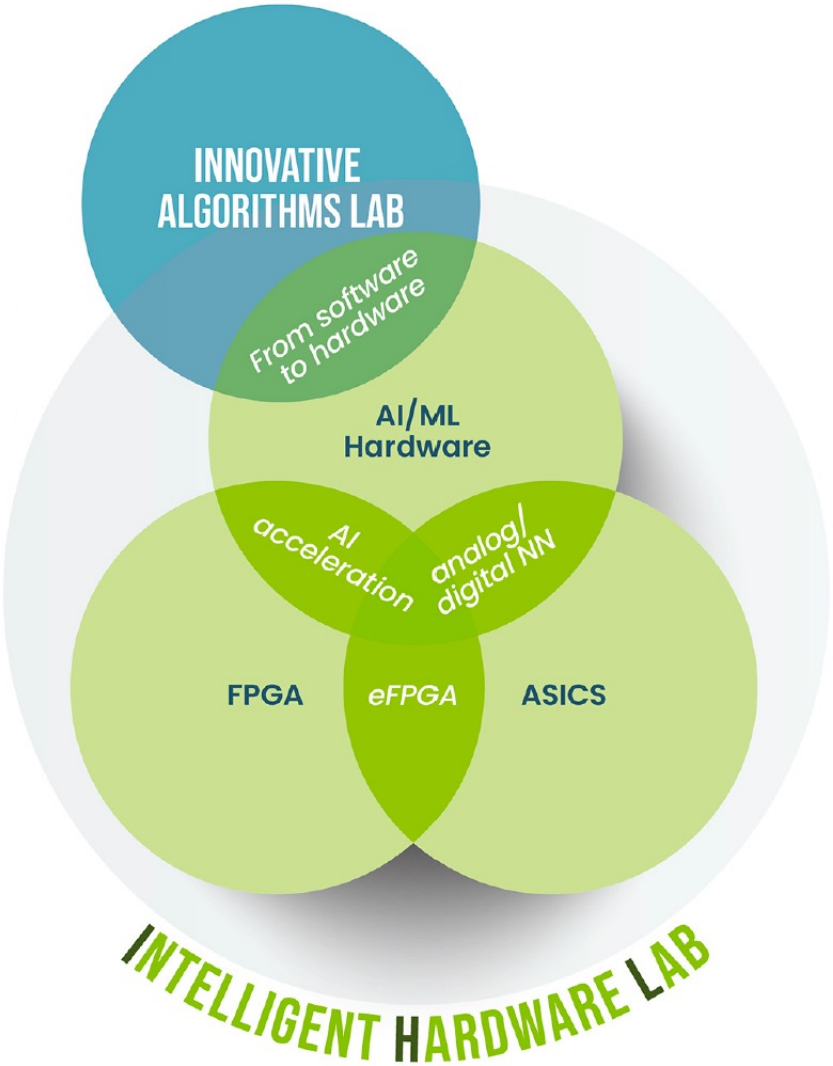
SI LAB Silizium Labor Bonn

JÜLICH Forschungszentrum

ZEA-2 Electronic Systems

INCYTE University of Siegen

COLOR MEETS FLAVOR
Technology Area 1



+ FPGA & electronics expertise at all CmF sites

IHL activities & tasks

FPGA-related support

→ Talk by Michael Karagounis

- FPGA-based hardware and firmware developments for DAQ
- AI/ML-accelerated FPGA systems
- Training in FPGA programming

ASIC-related support

→ Talk by Hans Krüger

- ASIC design for new experiments
- Support for (re-)use of existing pixel chips (monolithic or hybrid)
- Provision of radiation-hardened IP (BGR, PLL, ADC, power management, eFPGAs, microcontroller cores, …)
- Training in microelectronics / chip design tools
  Use of open-source Electronic Design Automation (EDA) tools and Physical Design Kits (PDK)

Research topics (examples)

- Innovative AI/ML-based detector concepts
- ASIC implementation for AI/ML algorithms, computing in memory / neuromorphic computing
- eFPGA in front-end ASICs for programmability & reconfigurability
- On-chip intelligence (software-programmable on-chip microcontrollers)
- Code-driven design/simulation framework for analog blocks
- …

IHL personnel

IHL Leader:

- To be elected from experts in CmF

4 Research Fellows:

- 1 already filled → Tetsuichi Kishishita (analog designer), tenured at U. Bonn (SILAB position)
- 3 to be advertised
  - 1 with tenure at U. Siegen
- Areas of expertise for the 3 fellows to be discussed ….

IHL resources

IHL operating budget: 120 kEUR / year

- Chip submissions
- Maintenance of FPGA and EDA resources
- Licenses

TA1 Ressources	2026	2027	2028	2029	2030	2031	2032
Staff Category	**Number of Persons**						
Professors [a]	0.5	1	1	1	1	1	1
Independent Junior Research Group Leaders	0	0	0	0	0	0	0
Postdoctoral Researchers	4.5	7	7	5	5	5	5
Doctoral Researchers	5	5	5	0	0	0	0
Other Staff	0	0	0	0	0	0	0

[a] Funding for Cluster Professors is provided by the universities.

4 of these are the IHL fellows