

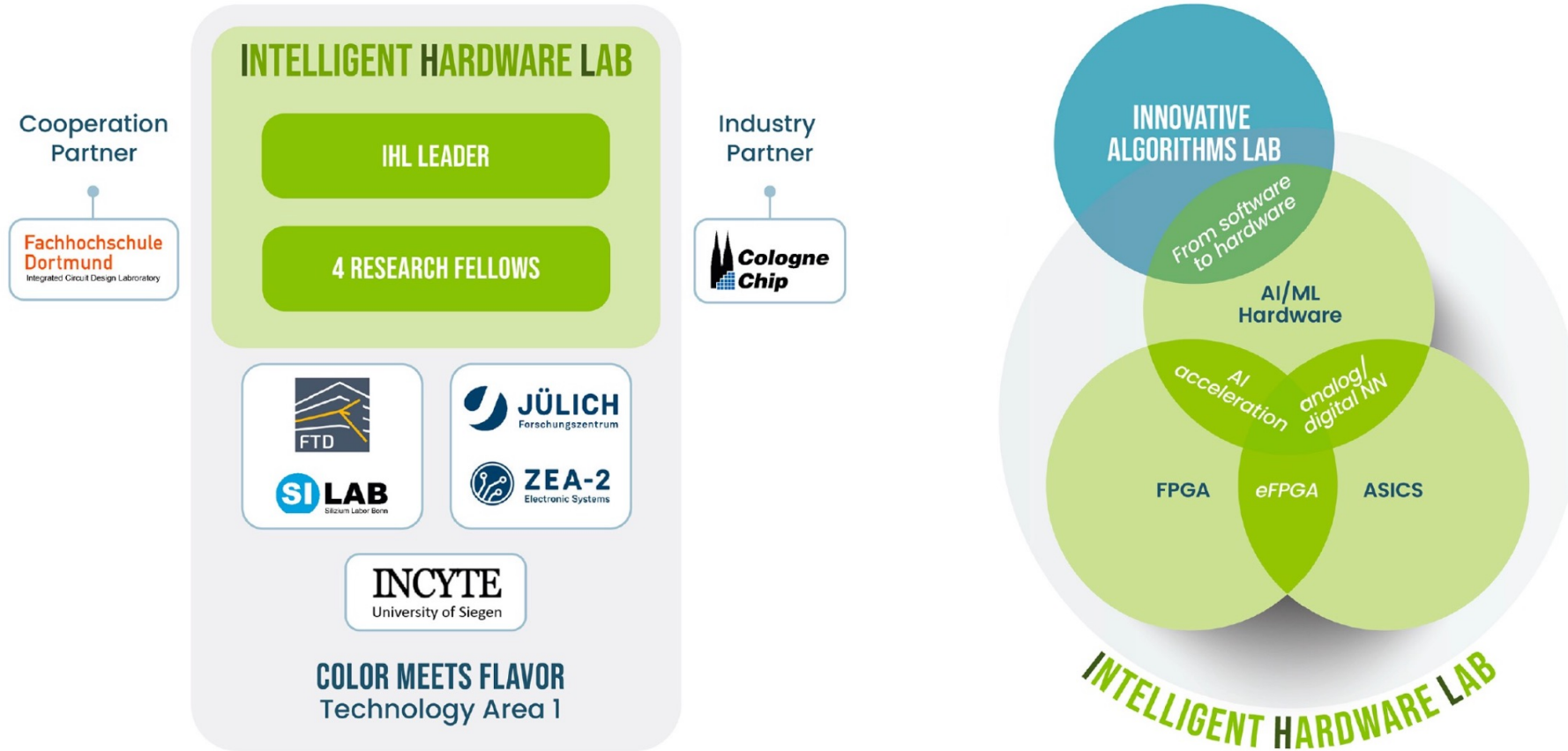
Intelligent Hardware Lab Vision and Objectives

uni-siegen.de

Qader Dorosti · IHL Kickoff Meeting



IHL Structure and Expertise Network



+ FPGA & electronics expertise at all CmF sites

From Existing Expertise to CmF Hardware Capability



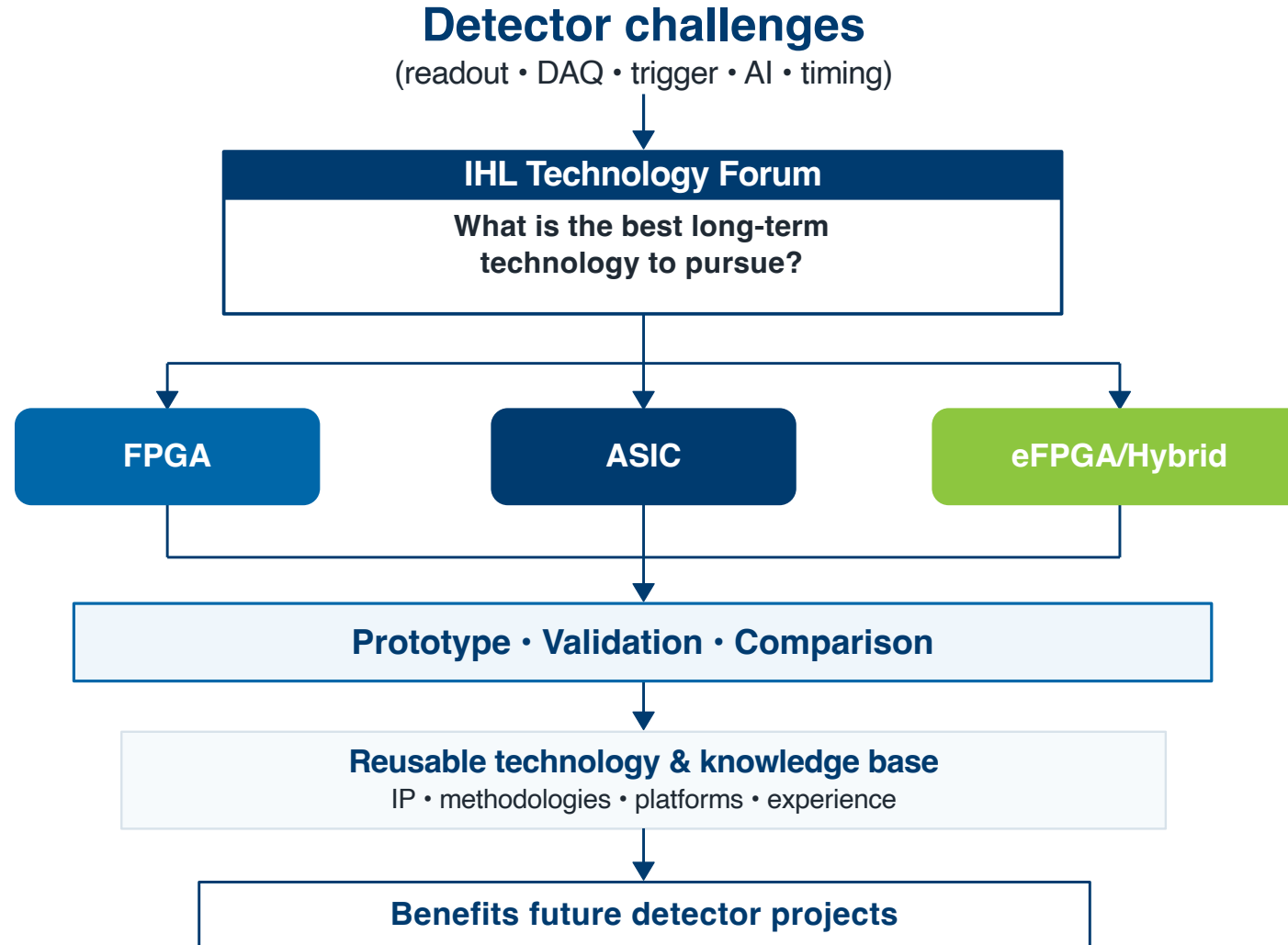
IHL Support Areas and Enabling Resources

Project hardware support	DAQ firmware · FPGA deployment · ASIC adaptation
Reusable technology base	rad-hard IP · eFPGAs and microcontrollers · firmware and design blocks
Intelligent electronics R&D	eFPGA · AI/ML hardware · neural front-end ASICs · in-memory and analog design

Enabling resources: fellows · FPGA/EDA resources · design databases · test-chip access · open-source EDA/PDK training · clean room



Detector Challenges as a Driver for Hardware Innovation



Desired Outcomes of Today's Kickoff



Success is leaving the meeting with a common direction and the momentum to build the IHL together

The Agenda

- At a glance
- 29 registered participants
- External speakers:
 - Michael Gude (Cologne Chip)
 - Dirk Koch (eFPGA / Jonas Künstler: Live Demo)
 - Johan Messchendorp (EuCAIF)
- 3 discussion sessions

Morning: Expertise • Afternoon: Vision • Closing: Action



IHL Kickoff meeting

▼ Friday Jul 17, 2026, 10:00 AM → 5:30 PM Europe/Berlin

▼ Room: US-C 109 (Universität Siegen – Unteres Schloss Campus)

▼ Michael Karagounis (IH Dortmund) , Qader Dorosti

Description

The Intelligent Hardware Lab (IHL) Kickoff Meeting marks the launch of the IHL within the Cluster of Excellence Cmf. The meeting brings together researchers and collaborators to present current activities, identify common research interests, and define the first collaborative projects and technology roadmap of the IHL.

Contact

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▼ Michael.karagounis@ih-dortmund.de

Registration

In-Person Attendance Registration

Remote Attendance Registration

Check details

Register

Participants

22 View full list

10:00 AM → 10:30 AM

Registration & Welcome Coffee

10:30 AM → 11:10 AM

Welcome & Vision

Convener: Qader Dorosti

10:30 AM

Welcome & Introduction

~ 10m

10:40 AM

The Intelligent Hardware Lab within the Cluster of Excellence Cmf

~ 15m

10:55 AM

Discussion: Vision and Objectives

Speaker: Qader Dorosti

~ 15m

11:10 AM → 12:25 PM

Current Expertise & Capabilities

11:10 AM

Digital ASIC Design within the Cmf Cluster

~ 10m

11:20 AM

Analog & Mixed-Signal ASIC Design

~ 10m

11:30 AM

FPGA Systems & Digital Electronics

Speaker: Michael Karagounis (IH Dortmund)

~ 10m

11:40 AM

AI-based Real-Time Waveform Triggering

Speaker: Qader Dorosti

~ 10m

11:50 AM

Digital Design Infrastructure & Continuous Integration

Speaker: Ilya Bekman (ICA (PGI-4), Forschungszentrum Jülich GmbH)

~ 10m

12:00 PM

AI Hardware Validation & Test Infrastructure

~ 10m

12:10 PM

Discussion: Existing Expertise and Future Opportunities

~ 10m

12:25 PM → 1:25 PM

Lunch

1:25 PM → 3:35 PM

Scientific Drivers & Strategic Partnerships

1:25 PM

INSIGHT: Detector Electronics Challenges and Opportunities for the IHL

Speakers: Benedikt Otto, Martin Bleker (Heinrich Heine Institut für Strahlen- und Kernphysik)

~ 15m

1:40 PM

Cologne Chip: Industrial Partnership and Future Collaboration

Speaker: Dr Michael Gute (CEO, Cologne Chip AG)

~ 15m

1:55 PM

eFPGA Technologies: Vision and Opportunities for the IHL

Speaker: Prof. Dirk Koch (Heidelberg University)

~ 15m

2:10 PM

EuCAIF: AI for Intelligent Hardware and Scientific Computing

Speaker: Prof. Johan Messchendorp

~ 15m

2:25 PM

Edge Computing Architectures and Prospects

Speaker: Dr André Zambanini (Forschungszentrum Jülich)

~ 15m

2:40 PM

Fast Readout & Precision Timing Electronics

~ 15m

2:55 PM

DEEP Project: Neural Networks on Hardware

Speaker: Patrick Schwäbzig

~ 10m

3:05 PM

Discussion

~ 30m

3:35 PM → 4:05 PM

Coffee Break

4:05 PM → 5:30 PM

Building the Intelligent Hardware Lab

4:05 PM

Developing the IHL Infrastructure & Ecosystem

~ 15m

4:20 PM

Technology Vision & Roadmap (ASIC, FPGA, eFPGA & AI Hardware)

~ 20m

4:40 PM

Round Table: Defining the First IHL Activities

~ 35m

5:15 PM

Summary, Action Items & Next Steps

~ 10m

5:25 PM

Closing Remarks

~ 5m

Follow and join the IHL activities

IHL website

color-meets-flavor.de/research/intelligent-hardware-lab-ihl

- IHL overview
- Partners and structure
- Visible entry point

IHL mailing list

listen.uni-bonn.de/wws/info/cmf-ihl

- Announcements
- Training dates
- Project coordination

Next step: make IHL visible, reachable, and useful for the first CmF hardware projects.