

The logo for HLRS, consisting of the letters H, L, R, and S in a black, sans-serif font, followed by a stylized blue vertical bar that also functions as the letter I.A photograph of a modern, multi-story building with a glass and metal facade, identified as the High-Performance Computing Center in Stuttgart. The building features a grid of windows and is set against a blue sky with clouds. A green lawn is visible in the foreground.

High-Performance
Computing Center
Stuttgart

The Future of HLRS

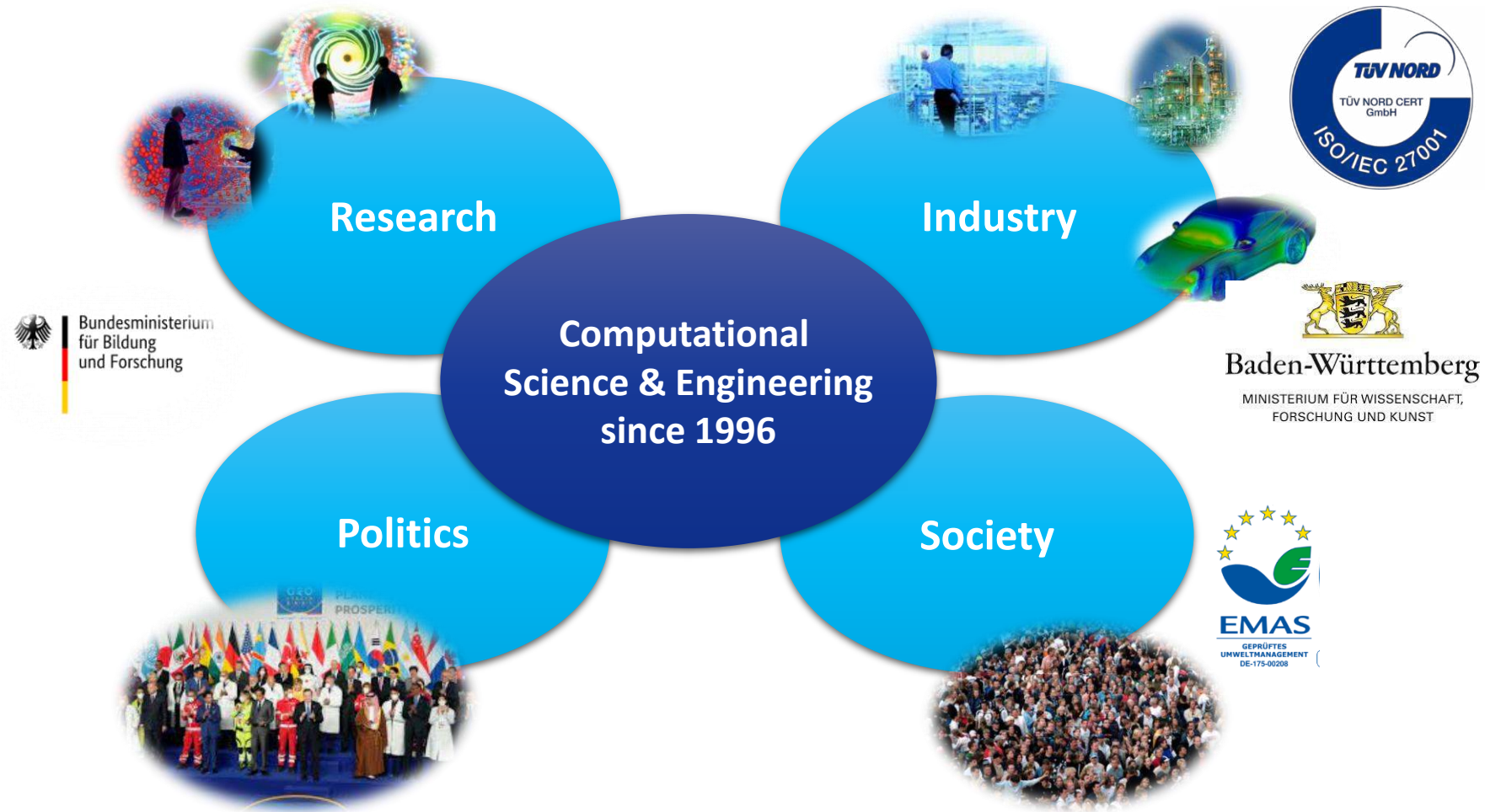
39. Workshop on Sustained Simulation Performance

May 27th 2025, Stuttgart, Germany

Michael Resch

Mission of HLRS

H L R I S



Our Fields of Focus

H L R I S

Engineering

Engineering is in the DNA of HLRS since 1996 making HLRS a leader in the fields of Automotive, Aerospace, Energy and Biomedical Engineering and Material Science



Artificial Intelligence

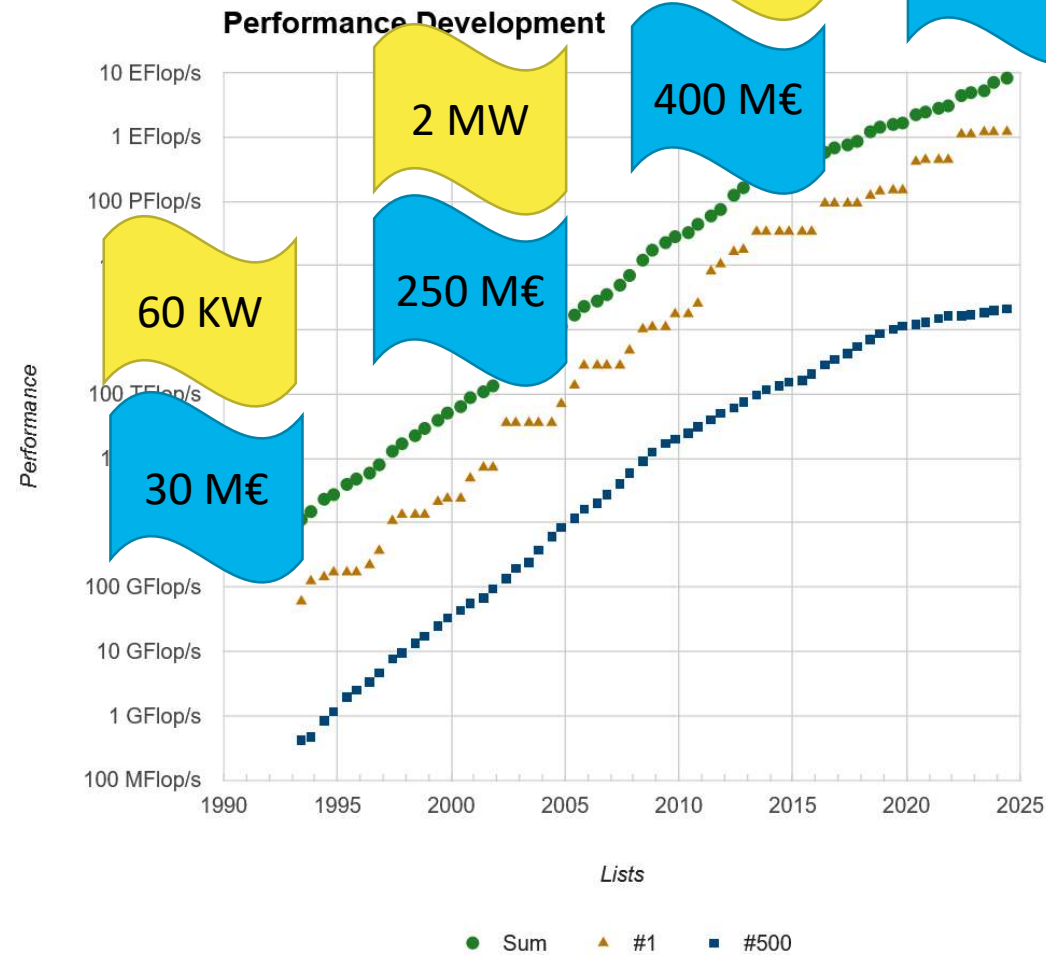
Artificial Intelligence has become a major application and a tool to help solving problems in many application fields at HLRS

Global Systems Science

Global Systems Science brings together a variety of fields of research to solve key problems of mankind

#1 TCO / Power in HPC

H L R I S



HPC has a cost
issue and a
sustainability
issue

www.top500.org

New Architectures – New Hopes

H L R I S

- Optical Computing
- Neuromorphic Computing
- Quantum Computing
- Biomolecular Computing
- ...

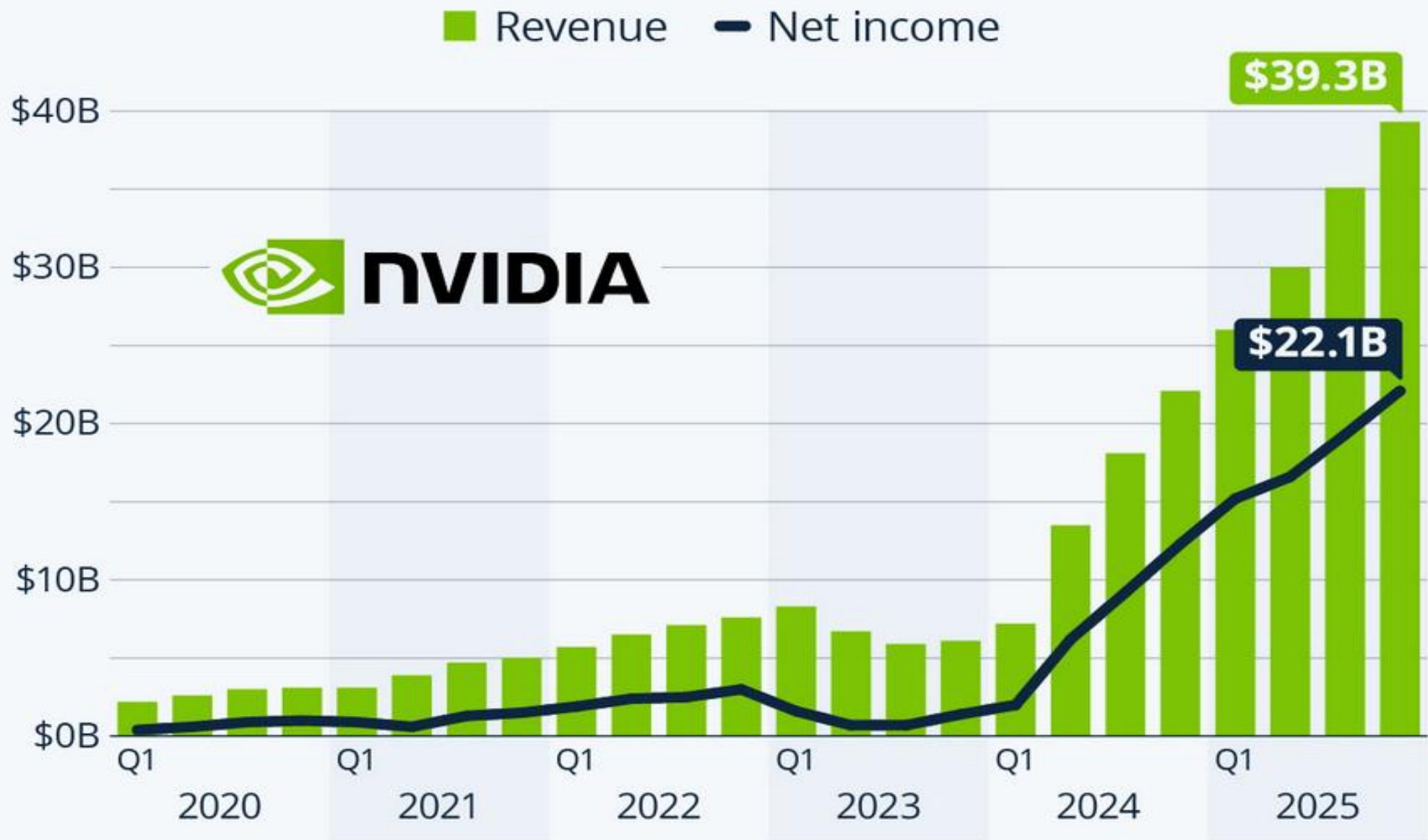


Innovative Architectures
Group
(Dr. Johannes Gebert)

Workshop on Future
Computing
Spring 2026



The Rise of AI



* Nvidia's fiscal year ends on the last Sunday of January.

Source: Nvidia

Trends

H L R I S

- Open Models
 - Llama
 - Mistral
 - ...
- Smaller Models
 - Targeted
 - Specific
 - Problem oriented



Seedbox»x

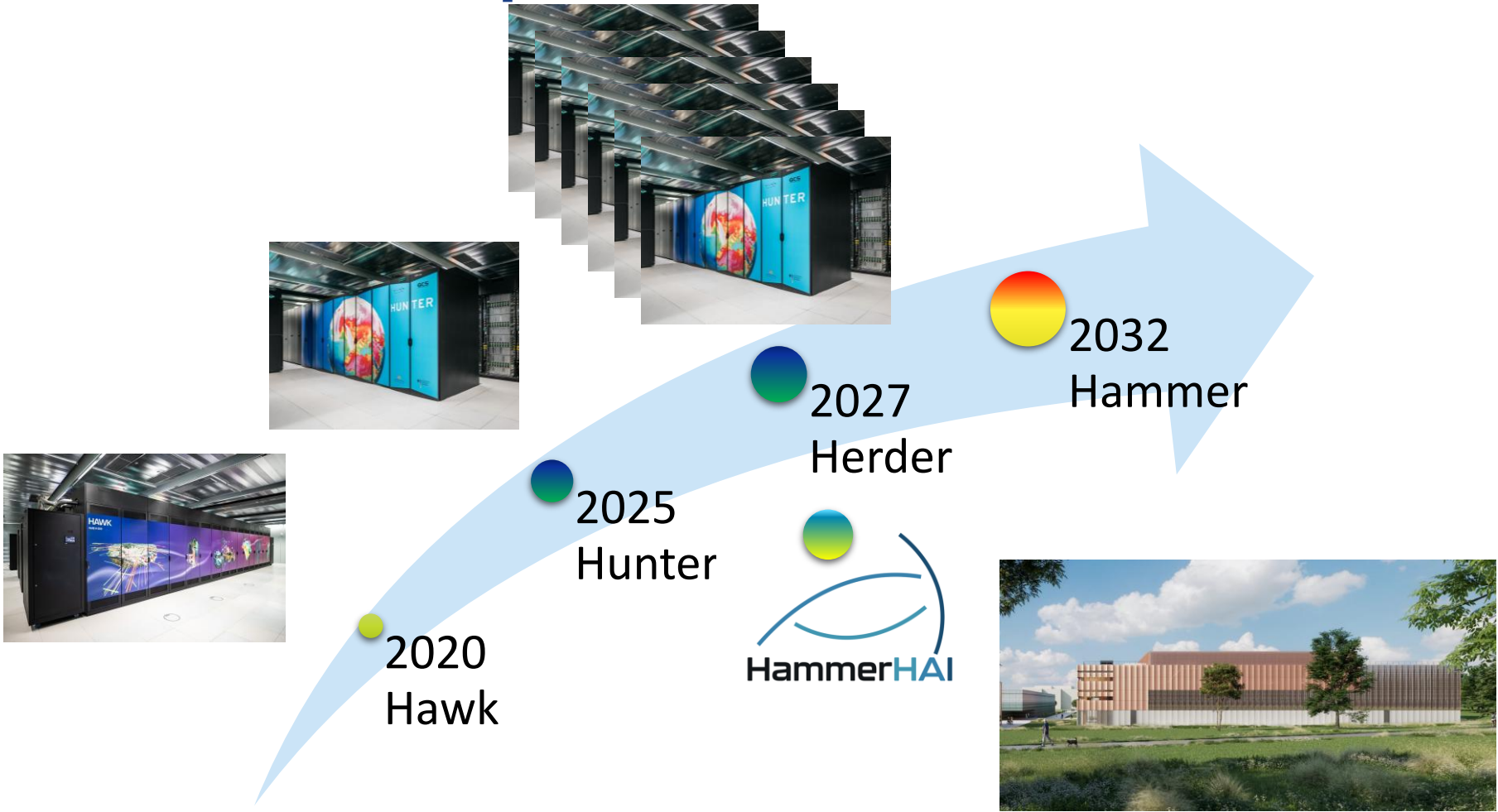
New Project and System at HLRS

H L R **I** S

- European AI-Factory
- 50 M€ Investment
- 21 M€ Operations
- 14 M€ Services



HLRS Hardware Roadmap



European AI Future: Giga Factories

H L R I S

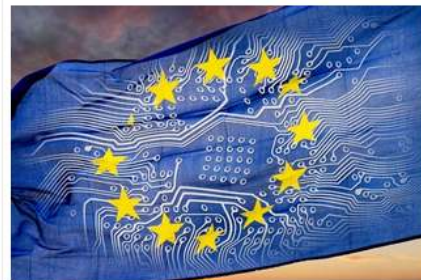
EU Launches InvestAI Initiative to Build AI Gigafactories Across Europe

February 12, 2025

Feb. 12, 2025 — At the Artificial Intelligence (AI) Action Summit in Paris, European Commission President Ursula von der Leyen has launched **InvestAI**, an initiative to mobilize €200 billion for investment in AI, including a new European fund of €20 billion for AI gigafactories.

This large AI infrastructure is needed to allow open, collaborative development of the most complex AI models and to make Europe an AI continent.

Commission President Ursula von der Leyen said: “AI will improve our healthcare, spur our research and innovation and boost our competitiveness. We want AI to be a force for good and for growth. We are doing this through our own European approach – based on openness, cooperation and excellent talent. But our approach still needs to be supercharged. This is why, together with our Member States and with our partners, we will mobilize



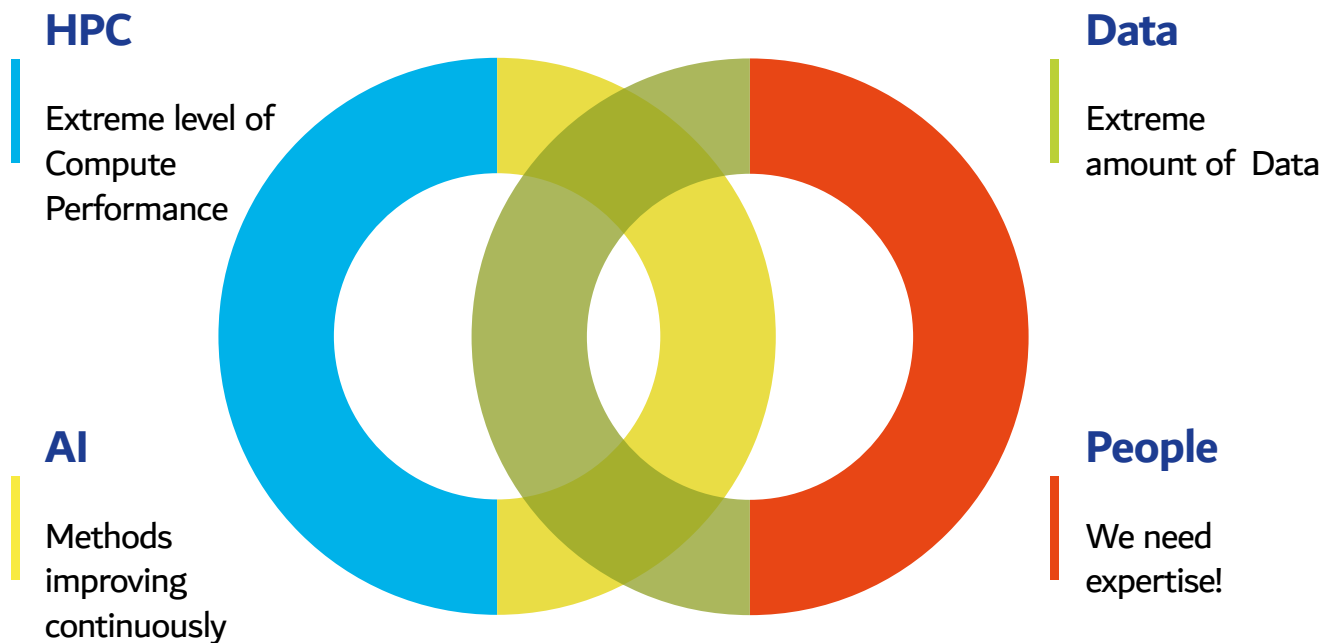
Credit: Shutterstock

The background is a dark blue field filled with a network of white lines connecting various colored dots (blue, green, pink, yellow). Overlaid on this is a large, stylized arrow pointing to the right. The arrow is composed of several overlapping, wavy bands of color, transitioning from blue on the left to a bright cyan on the right. The text 'Digital Convergence' is written in white, bold, sans-serif font in the lower-left quadrant.

Digital Convergence

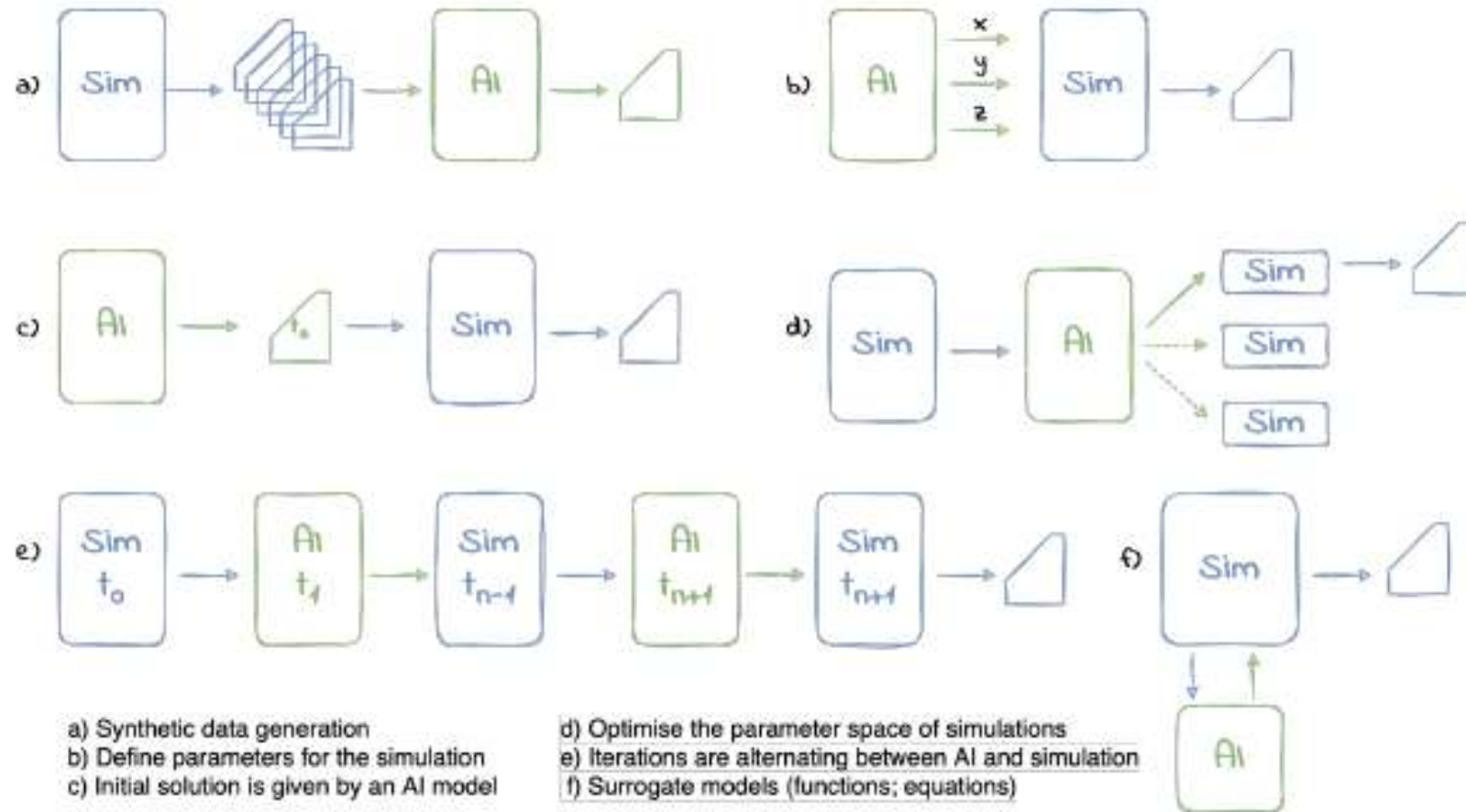
Bringing Things Together

H L R I S

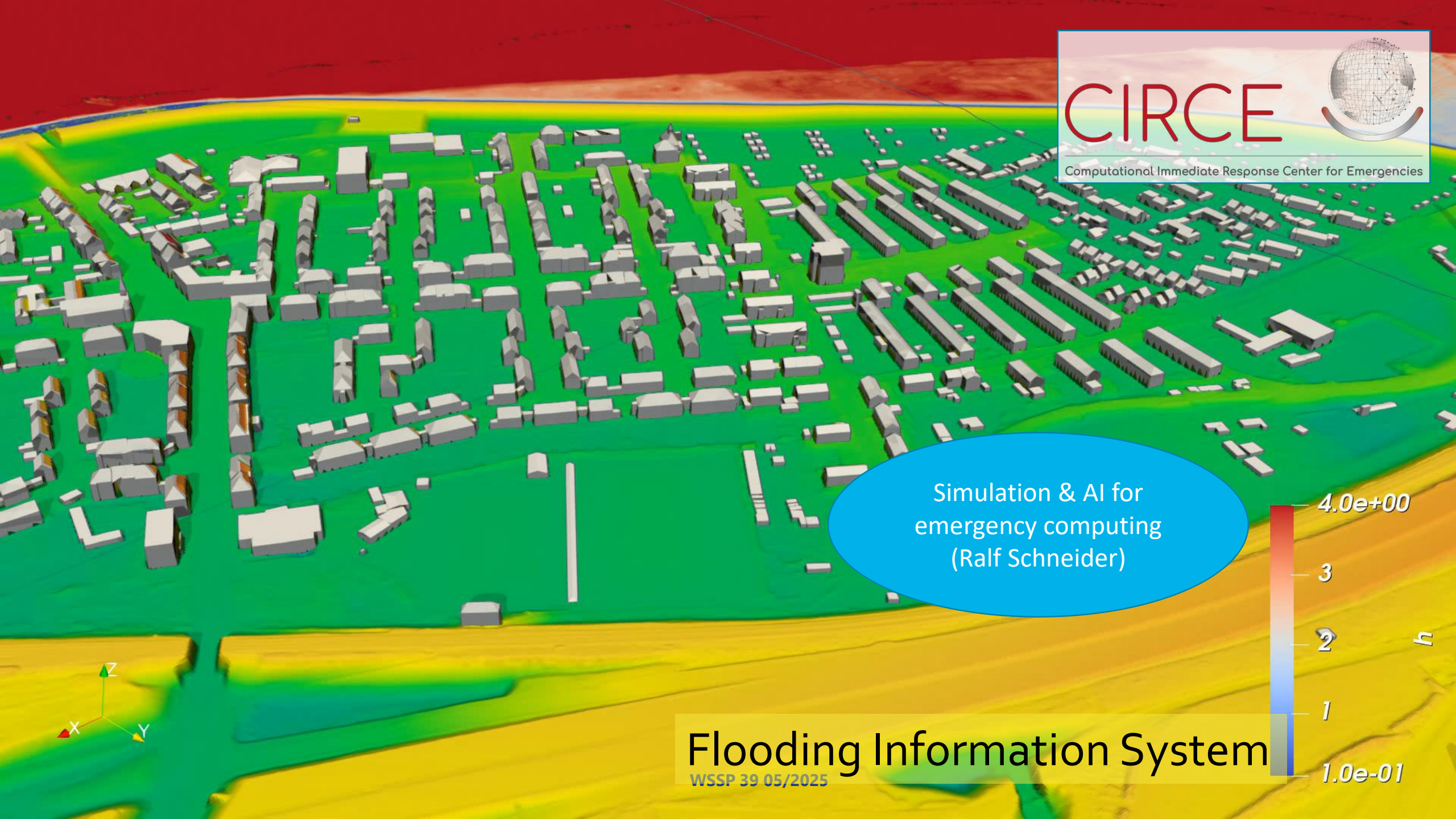


AI and Simulation

H L R I S



Converged Computing
(Dennis Hoppe)

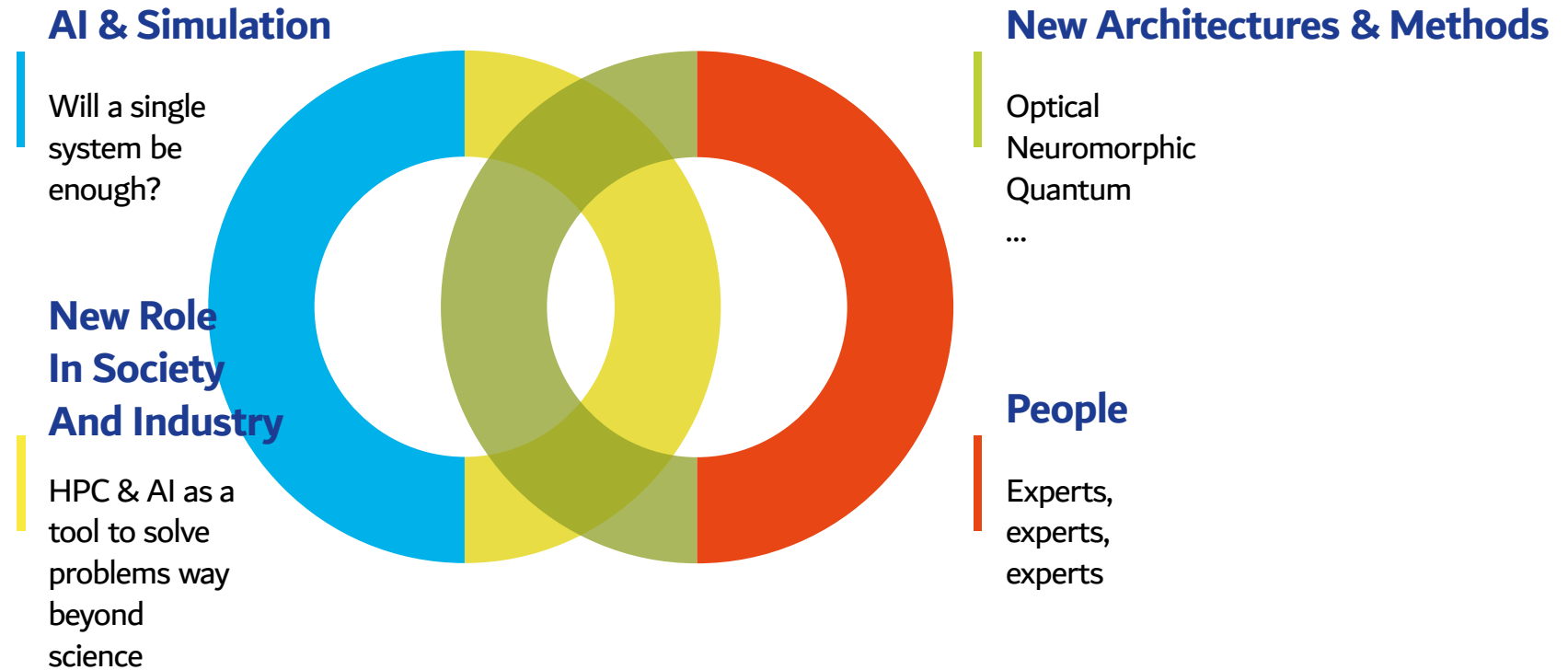


Flooding Information System

WSSP 39 05/2025

Future Challenges (for HLRS)

H L R I S



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HLRS

A photograph of a modern, multi-story building with a glass and metal facade, identified as the High-Performance Computing Center in Stuttgart. The building features a grid of windows and a prominent corner structure. The sky is blue with some clouds, and a green lawn is visible in the foreground.

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