





### Icelandic HPC National Competence Center for HPC & AI – Welcome & Workshop Objectives

PROF. DR. – ING. MORRIS RIEDEL, UNIVERSITY OF ICELAND & JUELICH SUPERCOMPUTING CENTRE (GERMANY)

11<sup>TH</sup> AUGUST, 1<sup>ST</sup> ICELANDIC HPC COMMUNITY WORKSHOP, UNIVERSITY OF ICELAND, ENDURMENNTUN, ROOM NÁMA











https://www.youtube.com/channel/UCWC4VKHmL4NZgFfKoHtANKg



IHPC National Competence Center for HPC & AI in Iceland















UNIVERSITY OF ICELAND SCHOOL OF ENGINEERING AND NATURAL SCIENCES

FACULTY OF INDUSTRIAL ENGINEERING, MECHANICAL ENGINEERING AND COMPUTER SCIENCE

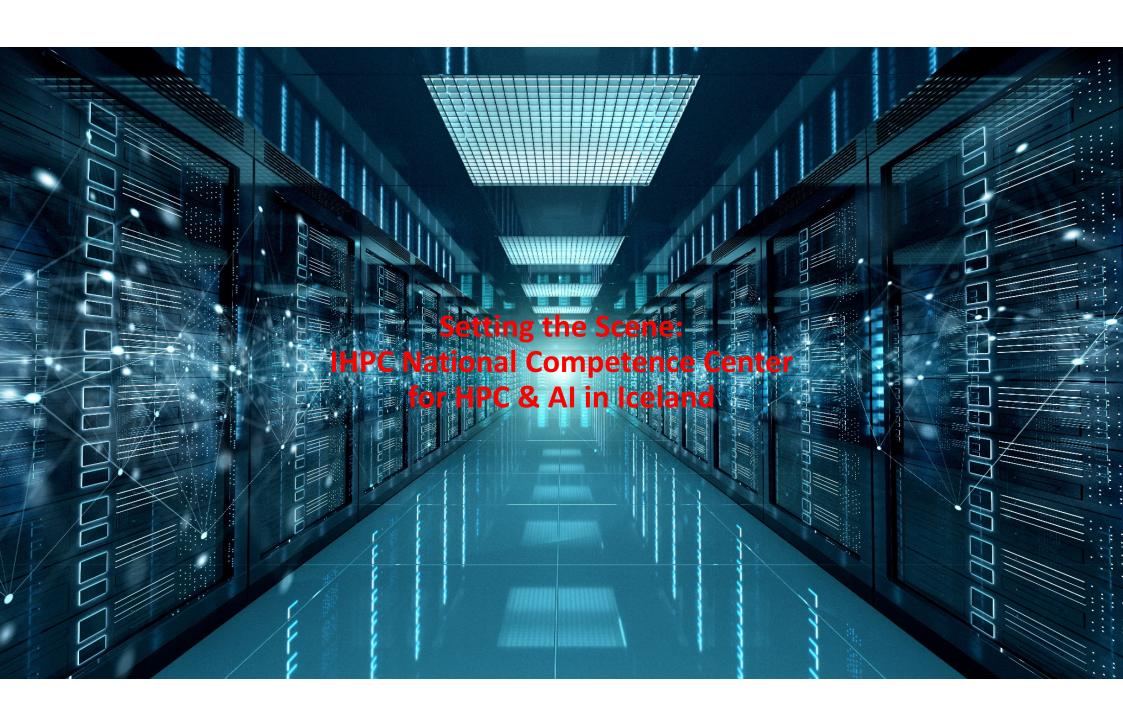












## **Executive Summary – Major Icelandic HPC Activities**

**HPC** 

#### rannís **Icelandic National Infrastructure for HPC**

- \* HPC hardware funds by RANNIS; now via roadmap IReiP
- Proposals yearly required to obtain funds still
- ❖ Joint proposal from IHPC community

### **EuroHPC EuroCC National Competence Center for HPC & AI**

- **EU Project (09/2020-08/2022), 2 years**
- Building Simulation and Data Labs **(SDLs)** of the IHPC Community of Users
- Supports industry engagement in HPC



Veðurstofa

Islands



- Organized around RANNIS proposals
- ❖ ~53 scientific experts & research group
- Uolceland/UoReykjavik, Iceland Geo Survey ÍSOR, Met Office & industry: Matis, etc.

### **EuroHPC LUMI Supercomputer in Finland**



❖ Co-Funds by EC and Iceland participation funds from: Uolceland, UoReykjavik, and Hannes Jonsson & Egill Skulason

### **Teaching & Education in HPC & AI**

- University of Revkjavik
- University of Iceland
- Arctic Webinar Series (with US partners)











### **International Cooperations**

- ❖ Tactical: ~4 Joint PhDs with Juelich Supercomputing **Centre** in Germany (#1 HPC System in Europe)
- ❖ Tactical: EC Projects like DEEP-EST, EOSC-Nordic, RAISE Center of Excellence (CoE), etc.
- ❖ Strategic: Plans of building an Icelandic National Lab with international cooperation together with Industry (e.g. Kaiser Global, other investors)



**S** 

**EURO** 





Icelandic HPC National Competence Center for HPC & AI – Welcome & Workshop Objectives

## **EuroCC Activities – Selected Benefits towards Bottom-Up Community Building**

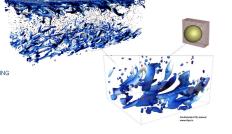




[1] Icelandic HPC Community Web page

- Simulation & Data Lab Communities
  - Experts w.r.t. **HPC in domain-specific topics**
- Based on extensive community experience
  - Juelich Supercomputing Centre in Germany works with the model for ~16 years







The Simulation and Data Lab computational fluid dynamics (SimDataLab CFD) is leading parallel computing in Computational fluid dynamics in Iceland at the University of Iceland. The SimDataLab is Iceland's representative in the international projects in CFD and parallel computing. SimDataLab CFD aims to develop parallel code applications in CFD and support users who have already developed parallel application codes. SimDataLab CFD participates in the European project network in parallel computing and has an infrastructure and access to powerful parallel systems in-memory optimization, processing system architecture, high scalability, and have performance optimization computer nodes

[2] IHPC SimDataLab CFD Web Page

Simulation and Data Lab Computational Chemistry

Advancement of theory and methodology for atomic scale simulations, with broad ranging applications for chemistry and physical chemistry, reaction rat

nulation of solvated molecules and the solid / liquid interface

[3] IHPC SimDataLab Computational Chemistry Web Page

[4] Juelich Supercomputina Centre, Simlabs



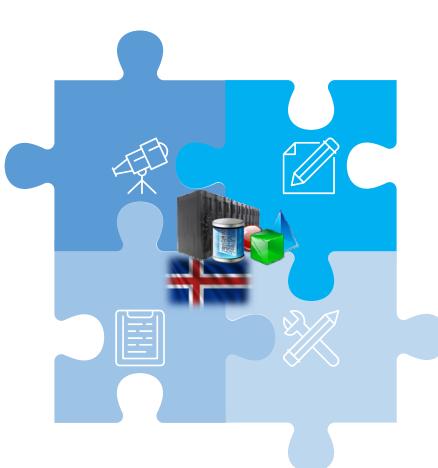
## **Workshop Objectives**

#### **F2F WORKSHOP**

Bring together a diverse group of Icelandic and international stakeholders to discuss the role of HPC and related areas within Iceland without losing sight of its international links.

#### PERFORM COMMUNITY BUILDING

Perform community building in developing new successful joint activities between academia and industry, potentially creating new joint Simulation and Data Labs or collaborations.



#### **DOCUMENT COMPETENCIES**

Document competencies, achievements, activities, and lessons learnt from participating stakeholders of Icelandic HPC efforts and associated international activities.

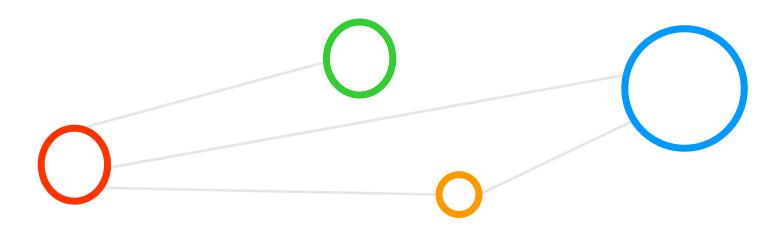
#### **RECOMMENDATIONS**

Identify best practices and core principles with a set of recommendations for developing the future Icelandic HPC ecosystem, including necessary skills, funding opportunities, applications, Centre of Excellences, community events, and sustainable infrastructure developments.

# **Workshop Agenda**

5:00 – 5:15	Informal Welcome – Participant Introduction & Discussions (Coffee/Tea/Refreshments, Snacks, and Sandwiches available)	All
5:15 – 5:25	Opening remarks & Workshop objectives & Introduction  EuroCC IHPC National Competence Center for HPC & AI	Prof. Dr. – Ing. Morris Riedel (University of Iceland)
5:25 - 5:30	Q & A	All
5:30 - 5:40	Infrastructure, Services, and HPCFlow from atNorth	Rui Gomes (atNorth)
5:40 - 5:45	Q & A	All
5:45 – 5:55	Simulation and Data Lab Computational Fluid Dynamics	Seyedreza Hassanianmoaref (University of Iceland)
5:55 - 6:00	Q & A	All
6:00 – 6:10	An Overview of the Reykjavik Institute and its Strategic Planning for Icelandic Stakeholders	Bill Patrowicz (Kaiser Global)
6:10 - 6:15	Q & A	All
6:15 – 6:25	From Management Games to the idea of "Dig In" and its future	Baldvin Albertsson & Björn H. Helgason (Vitargames)
6:25 - 6:30	Q & A	All
6:30 - 6:40	Accurate Virtual Acoustics Enabled by High-Performance Computing	Finnur Pind (Treble)
6:40 – 6:45	Q & A	All
6:45 – 7:00	Workshop Closing – Concluding remarks with next steps (Coffee/Tea/Refreshments, Snacks, and Sandwiches available)	All

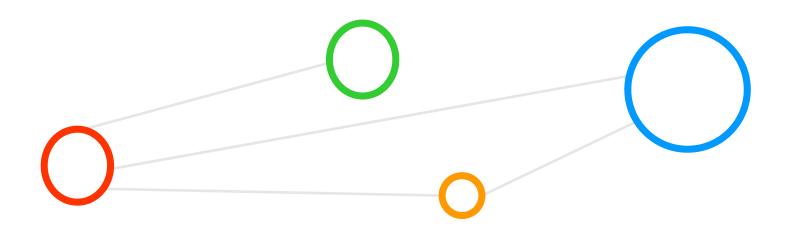
## **Selected References**



### **Selected References**

- [1] Icelandic HPC Community Web Page, Online: ihpc.is/community
- [2] Icelandic HPC Simulation and Data Lab Computational Fluid Dynamics (CFD), Online: https://ihpc.is/simulation-and-data-lab-computational-fluid-dynamics/
- [3] Icelandic HPC Simulation and Data Lab Computational Chemistry, Online: https://ihpc.is/simulation-and-data-lab-computational-chemistry/
- [4] Juelich Supercomputing Centre (JSC) Simulation and Data Labs, Online: https://www.fz-juelich.de/ias/jsc/EN/Expertise/SimLab/simlab\_node.html

# **ACKNOWLEDGEMENTS**



# **Acknowledgements – High Productivity Data Processing Research Group**



PD Dr. G. Cavallaro



**Senior PhD** Student A.S. Memon



PD Dr. M.S. Memon



**PhD Student** E. Erlingsson



**PhD Student** S. Bakarat



**PhD Student** R. Sedona



**PhD Student** P. H. Einarsson





Dr. M. Goetz (now KIT)



MSc M. Richerzhagen (now other division)



MSc P. Glock (now INM-1)



MSc C. Bodenstein (now Soccerwatch.tv)



MSc G.S. Guðmundsson (Landsverkjun)



**PhD Student** Reza



