Welcome to the 1st Artificial Intelligence Data Analysis (AIDA) School for Heliophysicists

Artificial Intelligence and Data Analysis (AIDA) in Heliophysics:

- EC Horizon 2020 Project
- 8 partners
- 6 countries
- Experts in:
  - Heliophysics
  - HPC simulations
  - Space physics
  - Machine Learning
  - Data analysis

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- Outreach and dissemination:
  - Increase awareness and improve the expertise in Machine Learning the European heliophysics community
  - Schools, tutorials, workshops

Artificial Intelligence and Data Analysis (AIDA) in Heliophysics:
Developing the AIDApy python package that centralizes and simplifies access to:

- Spacecraft data
- Space physics simulations
- Advanced statistical tools
- Machine Learning and Deep Learning algorithms and applications

Data Assimilation **Statistics** **Simulations** **Observations** **ML/DL**

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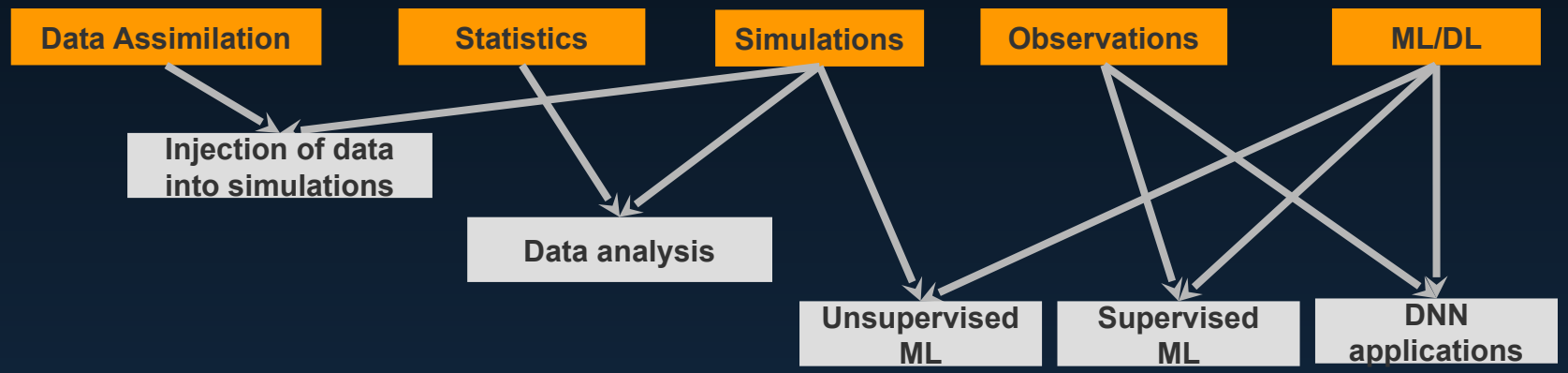

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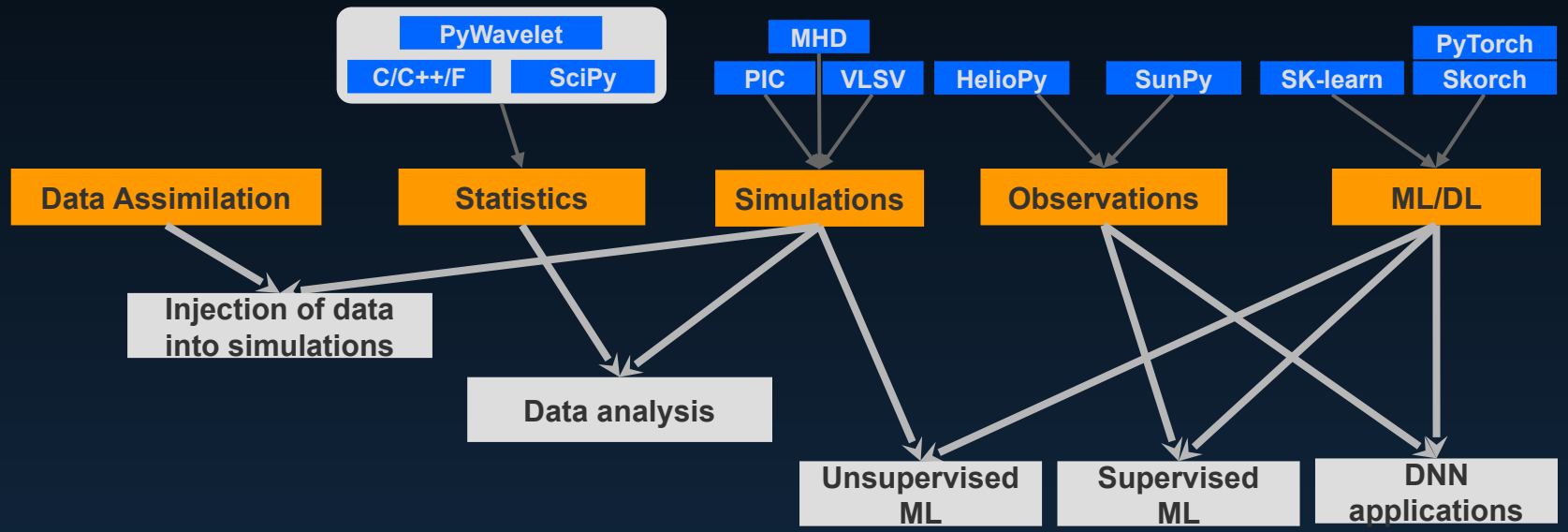

AIDA School lectures by

Prof. Dr.-Ing. Morris Riedel
Jülich Supercomputer Center
University of Iceland

Prof. Dr. Geert Jan Bex
Flemish Supercomputer Centre
KU Leuven
Hasselt University

Dr. Peter Wintoft
Swedish Institute of Space Physics

AIDA support team

Prof. Dr.-Ing. Giovanni Lapenta
KU Leuven
Principal Investigator

Dr.-Ing. Jorge Amaya
KU Leuven
co-coordinator

Dr.-Ing Francesca Delli Ponti
CINECA
Outreach and dissemination

Dr. Romain Dupuis
KU Leuven
Machine Learning expert

Dr. Hugo Breuillard
Laboratory of Plasma Physics
Ecole Polytechnique / CNRS
Data analysis expert

Objectives of the school

Learn the basics of Machine Learning

Learn how to acquire and process heliophysics data

Learn about the latest trends in Machine Learning

Program and announcements

Time	Day 1	Day 2	Day 3
9 - 10	Welcome and intro to the school (Giovanni Lapenta, Jorge Amaya)	Space missions data acquisition (Hugo Breuillard)	Review of ML applied to heliophysics (Peter Wintoft)
10 - 11	Introduction and differences between AI, ML, NN and Big Data (Morris Riedel)	Data manipulation in python with pandas, xarray, and additional python tools (Geert Jan Bex)	Review of ML applied to heliophysics (Peter Wintoft)
	Coffee break	Coffee break	Coffee break
11:30 - 12:30	Unsupervised learning (Morris Riedel)	Feature engineering and data reduction (Geert Jan Bex)	Reinforcement learning (Morris Riedel)
	Lunch	Lunch	Lunch
14 - 15	Unsupervised learning (Morris Riedel)	Data reduction and visualization (Geert Jan Bex)	Physics informed ML (Romain Dupuis)
15 -16	Supervised learning (Morris Riedel)	CNN, DNN (Morris Riedel)	Explainable AI (Jorge Amaya)
	Coffee break	Coffee break	Coffee break
16:30 - 18:00	Supervised learning (Morris Riedel)	CNN, DNN (Morris Riedel)	Performance and tuning of ML (Morris Riedel)

	Morris Riedel
	Geert Jan Bex
	Peter Wintoft
	AIDA member

Announcements:

- Coffe break
- Lunch
- Social Diner
- Presentations
- Filming/Videos

Enjoy the
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