

Welcome to the Knowledge Discovery Interest Group session

Interest Group in Knowledge Discovery

*“Knowledge Discovery is the task of processing and analyzing astronomical datasets with the aim of **extracting new knowledge**. This endeavor spans multiple disciplines including *visualization, data access and exploration, machine learning, statistical methods and workflow orchestration.*”*

- Chair: Raffaele D’Abrusco
- Vice-chair: Yihan Tao

Staying in touch

- ■ E-mail: kdd@ivoa.net
- ■ Slack: [IVOA#kdd](#)
- ■ Webpage:
<https://wiki.ivoa.net/twiki/bin/view/IVOA/IvoaKDD>

*"Knowledge Discovery is the task of processing and analyzing astronomical datasets with the aim of **extracting new knowledge**. This endeavor spans multiple disciplines including *visualization, data access and exploration, machine learning, statistical methods and workflow orchestration.*"**

* Facilitating the deployment and application of KD methods **where astronomical data can be found** is a crucial task

Goals

- ML-proofing existing and future science platforms
 - Are existing astronomy science platforms compatible with ML methods?
 - Investigate whether science platforms can access tabular and non-tabular data through VO interfaces.
 - Building libraries of well-established pre-trained models and integrating them in science platforms.

- Collecting resources for the "ready to ML in astronomy" kit
 - Library of datasets: collecting data for standard DM application for testing and benchmarking of KD models ("Iris datasets" for astronomy)
 - Looking at different "astronomy data challenges": can they represent the starting point for the library of astronomical datasets?
 - Collecting and describing methods for standardization/normalization of data used in astronomy, with reference data to test different implementations of the methods

Expectations

Seize the moment

- Take advantage of the built-in flexibility of IGs to pursue potentially interesting topics
- Act as liaison between the VO community, astronomical organizations/missions and the world at large

Ride the momentum

- Lobbying activity within the IVOA
- Enhance communication (Slack channel #kdd)
- Regular, focused, “in-between InterOps” meetings

Documents are what makes the (VO) world go around

- Draft one or more *notes* on distinct topics
- Aim for an *endorsed note*

KD-IG @2023 Spring InterOperability Meeting

KD-IG session: Tuesday 05/09, 11:00 AM (CEST)

- Sandor Kruk: *Exploring astronomy data archives at large scales using deep learning and crowdsourcing*
- Mini-session on generative language models and AI-powered tools
 - Y. Tao: *Foundation models for Astronomy*
 - A. Schaaff: *AI in querying astronomical data services*
 - R. Martinez-Galarza: *Intro to Transformers*
 - Ioana Ciucă: *Galactic ChitChat: Using Large Language Models to Engage with Astronomy Literature*
 - Adrian Damian: *Discover IVOA with ChatGPT*
 - □ Discussion about generative language models

Other (very) relevant sessions

- ■ Science Platforms sessions I and II
- ■ Grid and Web Services (GWS) Sessions I and II

Artificial Intelligence-powered chatbots

- ◇ The basics of the ML methods at the core of these tools
- ◇ Practical applications to astronomical research
- ◇ Commercial (gargantuan, general-purpose, available now) vs open (agile, curated, in the making) tools
- ◇ Extension to non-language outputs