



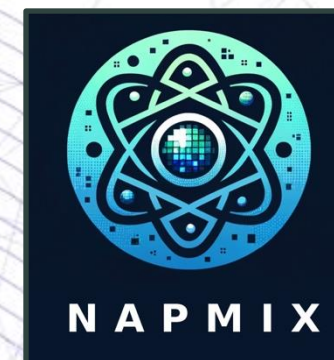
OSCARS

Open Science Clusters' Action
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NAPMIX - Nuclear, Astroparticle, and Particle Physics Metadata Integration for eXperiments

Presenter: Oliver Knodel, Helmholtz-Zentrum Dresden-Rossendorf, 0000-0001-8174-7795

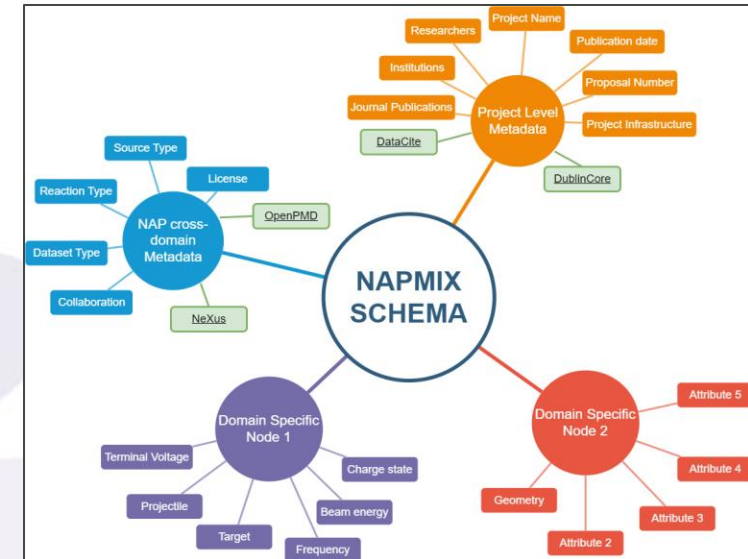


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- The NAPMIX project emerged to address a significant gap in nuclear, astro-particle, and particle physics: the lack of a unified metadata schema necessary for achieving FAIR datasets.
- This challenge extends cross-domain, highlighting the need for a collaborative European effort to create a common metadata schema with user-friendly infrastructure.
- By integrating expertise across these domains, NAPMIX aims to enhance data management practices.



- Front-end generator for user and API inputs.
- Outputs in machine and human-readable formats.
- Scheme deployment across multiple use cases to enhance FAIRness.
- Training for researchers on metadata application.
- Project promotion and onboarding of new partners.
- Collaboration with ESCAPE, PUNCH4NFDI, EURO-LABS...

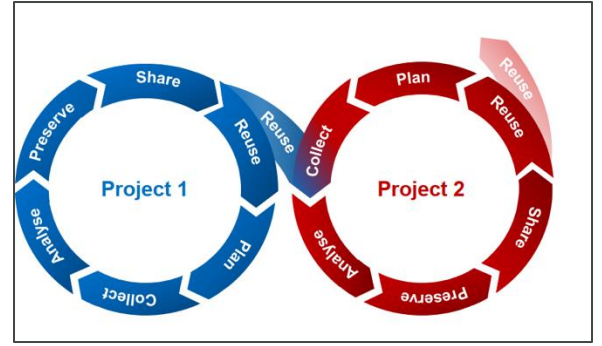
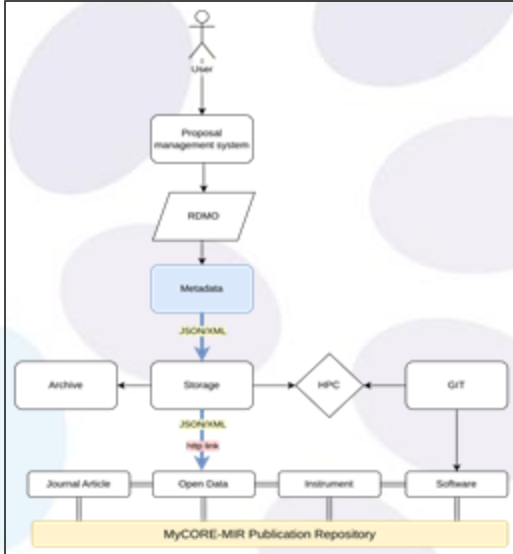
Enhancing Data Management in Nuclear Physics through a F.A.I.R.-Compliant Metadata Schema

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Abstract. Within the field of experimental nuclear physics, steps are underway to further advance good Research Data Management practices. At the heart of this is the goal of generating well-described F.A.I.R.-level experimental data and ensuring compliance with these principles. Here, we describe the landscape of research data management in the nuclear physics domain, with focus on supporting future actions with a F.A.I.R.-compliant metadata schema prototype for the community. The schema's nodal, multi-layered structure supports metadata enrichment across domains, and a user-friendly generator facilitates schema customisation and export in various formats. We detail the development process, key features, and potential applications. An outlook is given toward broader expansion of the schema to cross-domain physics fields.

Pilot Study Results -> In Publication



- Lack of user uptake: Dedicated workshop and maintain continued discussions with researchers involved in the project.
 - Complexity of use cases: Ensure requirements are defined and validated. Aim for Minimum Viable Product.
 - Scope Creep via expansion on additional features: Adhere to project goals and consider additional features only as potential future enhancements.
 - Varying IT infrastructure (AAI, Front end selection etc.) across institutions: Ensure flexible technical implementation.
 - Loss of consortium partner: Ensure use cases are diverse to cover a broad range of experimental NAP physics.
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R/ESFRI	Example Use Case 1	Example Use Case 2	Physics Area	Experimental techniques
GSI	FRS (Fragmentation reactions and production of exotic nuclei)	RADRRIS (Laser Spectroscopy of heavy elements)	Nuclear Structure; Atomic Physics;	Heavy Ion accelerator; Mass measurements and Laser Spectroscopy
FAIR	Super-FRS	Condensed Baryonic Matter	Nuclear Structure; Hadron Physics	Heavy Ion accelerator Exotic Nuclei
DESY	ALPS (Dark Matter)	LUXE	Particle Physics: Dark Matter/QED	Electron accelerator; Laser Spec
SPIRAL2/GANIL	Cyclotrons Experiments (VAMOS, LISE, EXOGAM)	SPIRAL2 (NFS, S3, DESIR)	Nuclear Structure; Nuclear Dynamics	Heavy Ion accelerator
CNA-Seville	1MV Tandemtron	3 MV Tandem	Nuclear physics; Material science; Environmental radioactivity	Ion Beam Analysis; Accelerator Mass spectrometry
CMAM-Madrid	5MV Tandem		Nuclear physics; Material science;	Ion Beam Analysis;
LATR-IST	3 MV Tandem accelerator	2,5 MV Van de Graaff accelerator	Nuclear physics; Material science;	Ion Beam Analysis
HUN-REN ATOMKI (Debrecen)	18MV Cyclotron CLEAR ATOMKI (Search for emission of bound identical nucleons)		Nuclear physics	Experimental techniques: p and d beams by cyclotron, production of neutrons
TU Darmstadt	S-DALINAC - DAGOBERT		Nuclear Structure	Electron-Gamma Coincidences
HZDR	Felsenkeller 5MV Pelletron		Nuclear Astrophysics	Ion Beam Analysis and Cross section measurements
KIT	High-energy astroparticle physics (KASCADE-Grande, Auger, IceCube)	Metadata Concept Preparation for the Einstein Telescope (Gravitational Waves)	Astroparticle physics	Extensive air shower experiments array; Multi-messenger astronomy



NAPMIX Kick-Off @ GSI: 5th-6th February 2025

