EVERSE

Paving the way towards a European Virtual Institute for Research Software Excellence
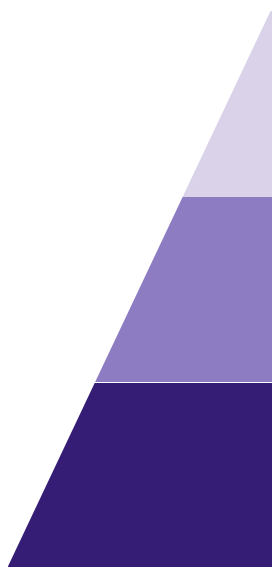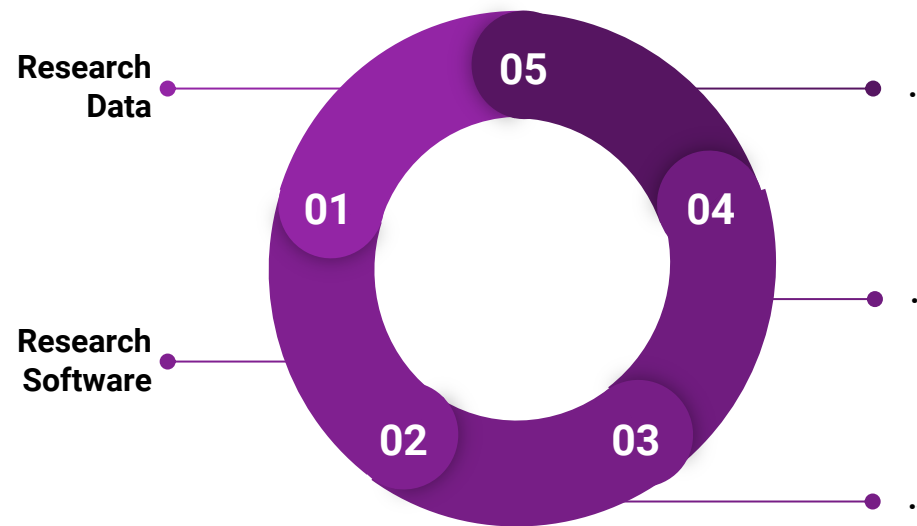
11 | 03 | 2024 by Fotis Psomopoulos (INAB|CERTH)

Research Software as a first class citizen for the scientific endeavours

Research Data

Research Software

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01
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Research software infrastructure
1 It involves research software that captures more broadly accepted and used ideas, methods and models for use in research, and warrants close researcher involvement in their development.

Prototype tools
2 It refers to research software that demonstrates a new idea, method or model for use by others outside the project within which it originated, often as a substantive intellectual contribution in its own right and often in the form of a proof of concept.

Analysis code
3 It includes research software that captures computational research processes and methodology, and often occurs in the context of simulation, data generation, preparation, analysis and visualisation.

abundance

Importance

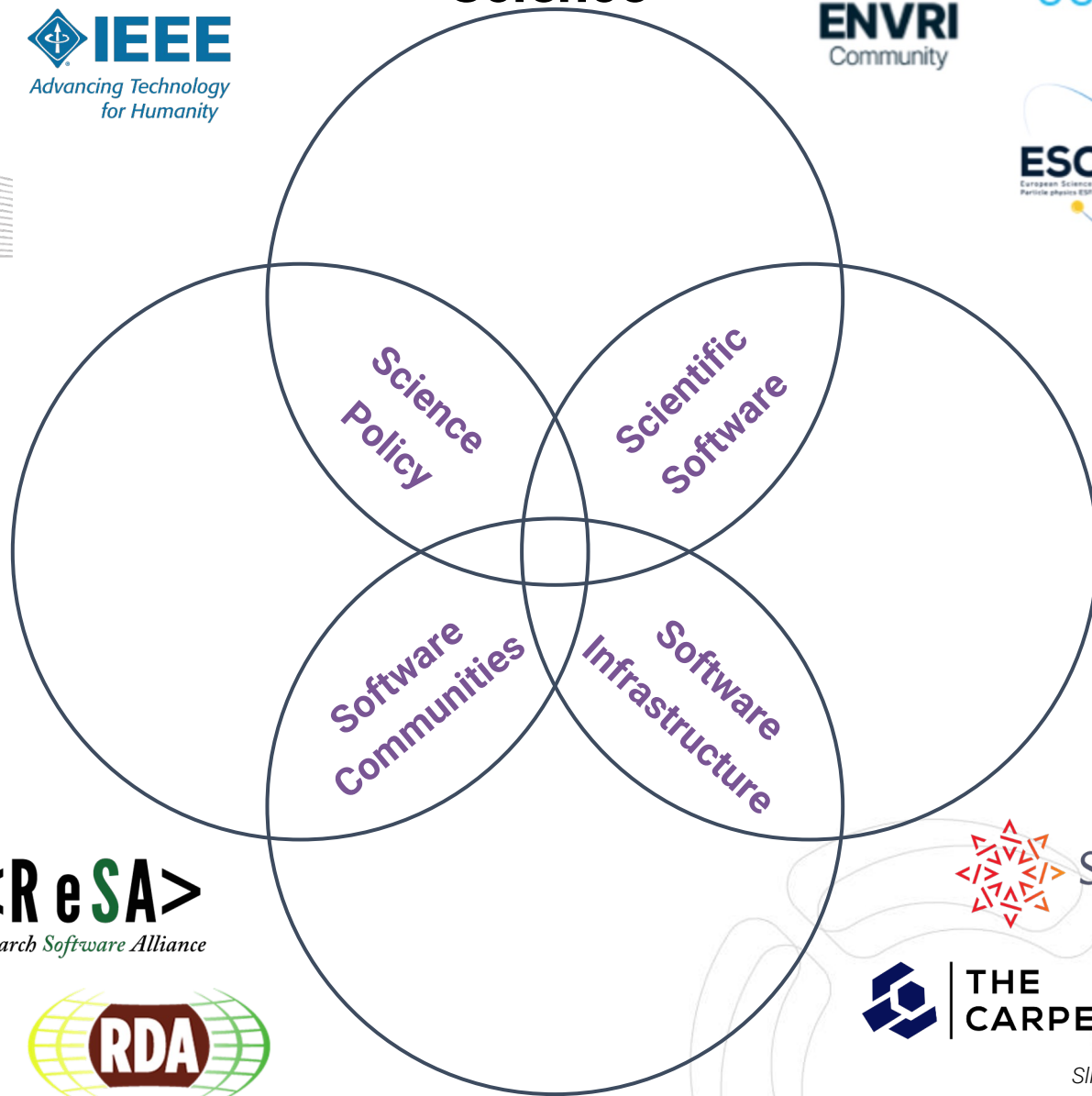**Foundational Software**

Not all software has the same level of importance

Science

Leadership

Software

Communities

Science Policy

Scientific Software

Software Communities

Software Infrastructure

Slides adapted from the "OrgMycology - eResearch NZ 2024" by Jonah Duckles (orgmycology)

EVERSE

Paving the way towards a
European **V**irtual Institut**e** for **R**esearch **S**oftware **E**xcellence

> **EVERSE** aims to create a framework for research software and code excellence, collaboratively designed and championed by the research communities, in pursuit of building a European network of Research Software Quality and setting the foundations of a future Virtual Institute for Research Software Excellence

ensure research software curation, quality, preservation and adoption of best practices, by the Communities, for the Communities, build on collaboration with the five EOSC Science Clusters

adopt a three-tier model for research software, i.e., analysis code, prototype tools and research software infrastructure, which captures the varying complexity of research software and its development, and can be used as a basis for research software excellence
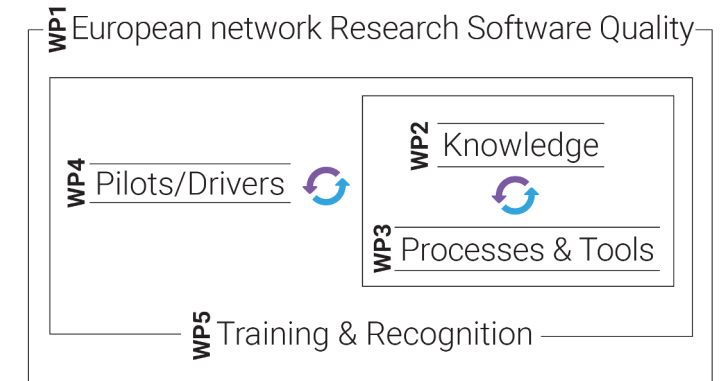
credit and recognition for both developers and software are essential components of our strategy to promote sustainable software practices

- **Start**: 1 March 2024 (36 months)

Partners, associates, and affiliated entities

Objectives

1. Build a collaborative, community-led structure for evaluating, verifying, and improving the quality of research software and code, by actively involving researchers, software developers, and other stakeholders in the research community.

2. Leverage existing tools and resources to support the evaluation, verification and improvement of research software and code quality, based on existing practices and standards across research communities represented by the five EOSC Science Clusters.

3. Establish a sustainable and collaborative ecosystem of stakeholders across the research communities associated with the five EOSC Science Clusters to ensure research software and code quality assurance and support the advancement of reliable and reproducible research.

4. Provide a framework that will ensure appropriate recognition, reward, and career development for researchers and RSEs who implement research software and code quality assurance practices and policies

Expected Outcomes

- A framework of community curation is established and promoted that ensures quality of software and code across the different disciplines.

- Infrastructure, tools and services are deployed that allow researchers to properly develop, describe with proper metadata, version, archive, share and reuse research software.

- The notion of software quality is defined in the context of EOSC and builds upon established practices by the FAIR and other communities.

- Baseline quality indicators of "minimum quality" defined for the different types of digital objects targeted (software, code, etc), taking into account the concept of "fit for purpose".

Expected Impact

- The quality of research software (technical and organisational) improved, in general (e.g. software for data analysis) and in particular for software used in the services offered through EOSC.

- Software is developed in a sustainable way and its reuse is maximized.

Pilots & Drivers

Environmental Sciences: *Integration of Science Cluster ENVRI through ENVRI-HUB*
- Integrate EVERSE framework into the ENVRI-HUB Knowledgebase and Virtual Research Environment
- Apply to the development of the Essential Climate Variable computing program and cloud workflows

Life Sciences: *Integration of Science Cluster EOSC-Life through ELIXIR*
- Make RO-Crate actionable by incorporating the five safes concept into WfExS for secure and federated workflow orchestration
- Use of community-led standards for materialising research software packaged using container technologies and mobilising encrypted data whenever needed

Astronomy and particle physics: *Integration of Science Cluster ESCAPE through the Dark Matter Test Science Project*
- ML for scientific data compression (standalone code, python)
- A Common Tracking Software
- Choose an ATLAS trigger algorithm as an option for the collaboration

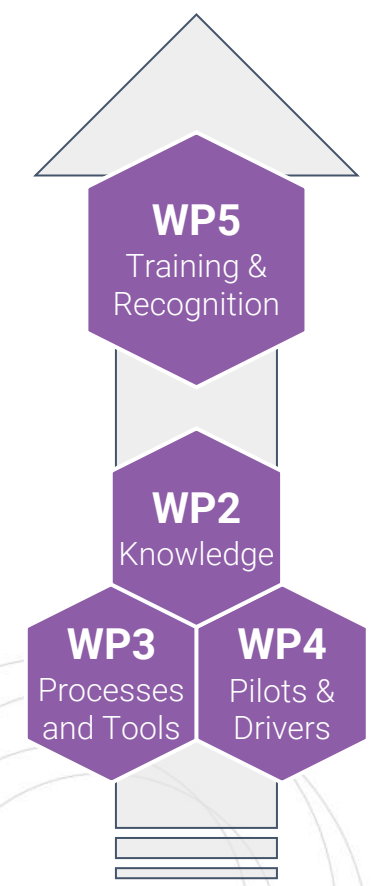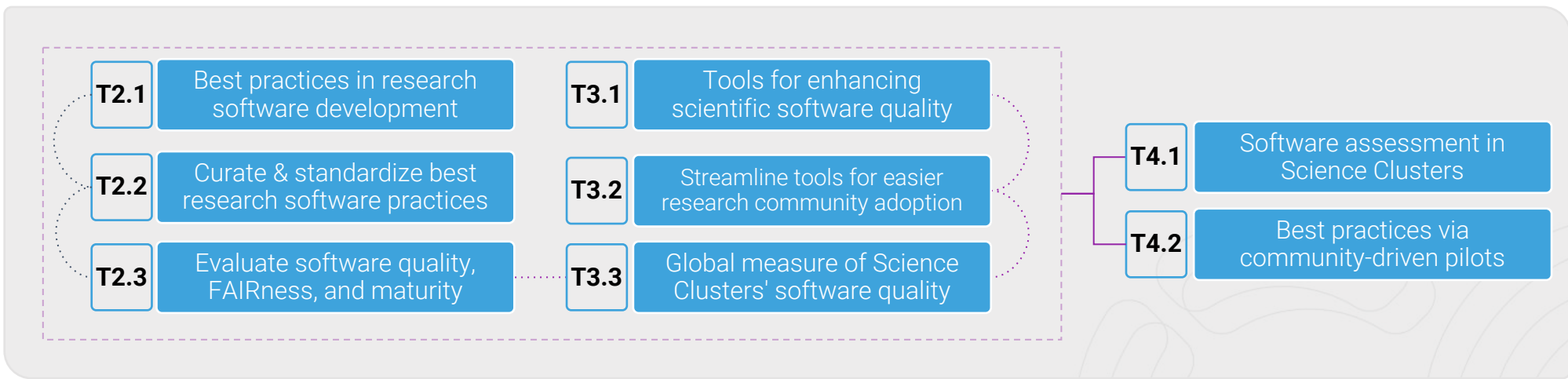**Proton and neutron science:** *Integration of Science Cluster PaNOSC through LEAPS/LENS*
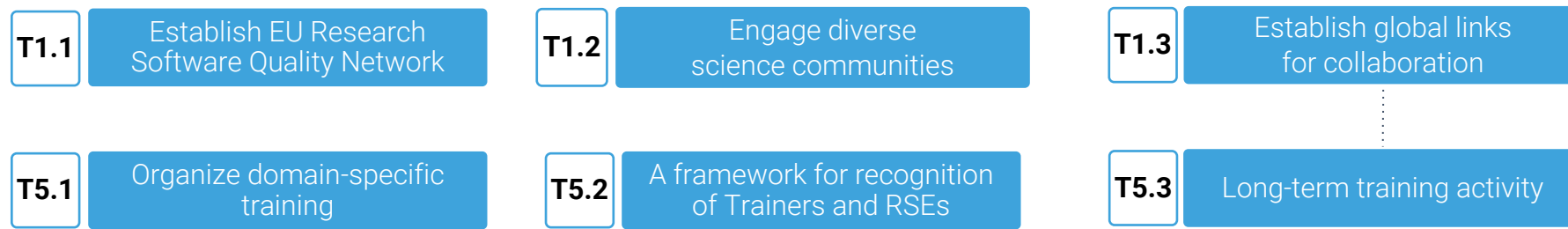Transition software to high performance computing (HPC) and heterogeneous computing architectures

Social sciences: *Integration of Science Cluster SSHOC*
Develop a multilanguage textual analysis pipeline of tools that use a combination of open source tools and own code to create an integrated SotA tool capable of deploying locally or as a service
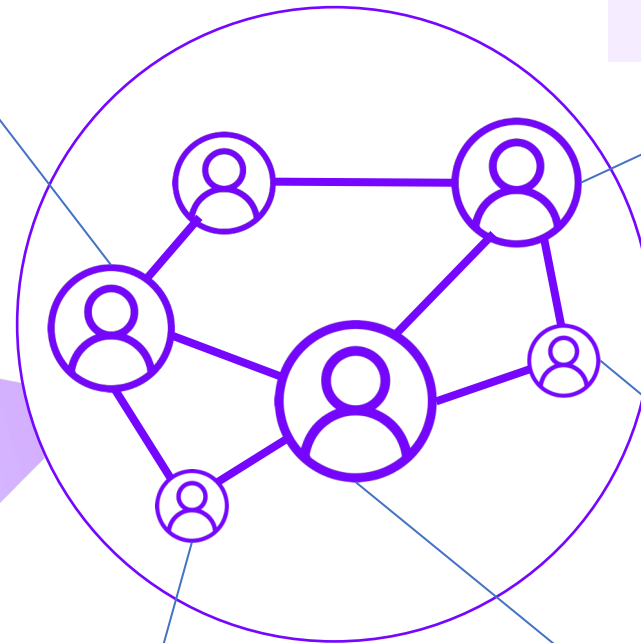
Technical Overview

T1.1	Establish EU Research Software Quality Network	**T1.2**	Engage diverse science communities	**T1.3**	Establish global links for collaboration	
T5.1	Organize domain-specific training	**T5.2**	A framework for recognition of Trainers and RSEs	**T5.3**	Long-term training activity	

T2.1 Best practices in research software development

T2.2 Curate & standardize best research software practices

T2.3 Evaluate software quality, FAIRness, and maturity

T3.1 Tools for enhancing scientific software quality

T3.2 Streamline tools for easier research community adoption

T3.3 Global measure of Science Clusters' software quality

T4.1 Software assessment in Science Clusters

T4.2 Best practices via community-driven pilots

WP5 Training & Recognition

WP2 Knowledge

WP3 Processes and Tools

WP4 Pilots & Drivers

Our Ambition

Thank you!

Contact: everse-contact@lists.certh.gr