OSCARS
Open Science Clusters' Action for Research & Society

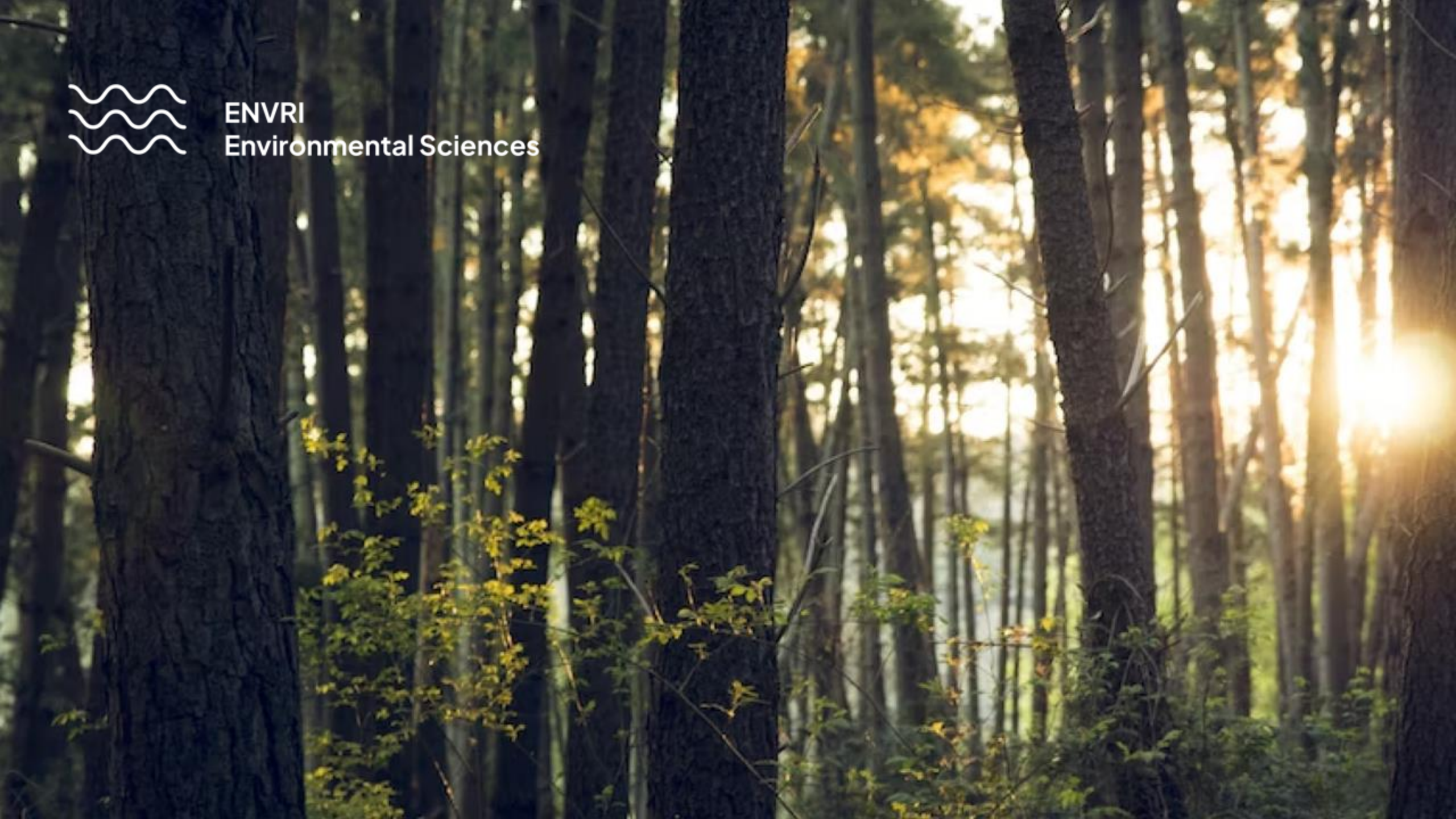
OSCARS Funded Projects

By Science Cluster and thematic area

Funded by the European Union

Research Infrastructures and Communities

The science clusters have grown out of five collaborative projects funded by the European Union in 2019 to link ESFRI and other world-class Research Infrastructures (RIs) to the European Open Science Cloud (EOSC). The services developed by the clusters and other outcomes of the projects are cornerstones of the emerging EOSC fabric and support both disciplinary communities and multidisciplinary initiatives with harmonised models for access to data, tools, workflows and training. Each cluster unites multiple RIs in their specific scientific domain.


ENVRI
Environmental Sciences

OSCARS
Open Science Clusters' Action for Research & Society

Repositories | ENVRI Science Cluster

EVA-FAIR

Challenge: Inconsistent metadata and data formats hinder the reuse and integration of vegetation data across Europe.

Solution: Develop standardised workflows and tools to move European Vegetation Archive (EVA) data towards open access, publishing them in trusted and FAIR-compliant repositories.

Impact: Enhanced data interoperability and accessibility, supporting ecological research and biodiversity conservation efforts.

GOYAS

Challenge: Remote sensing datasets often lack comprehensive metadata, limiting their reproducibility and reuse.

Solution: Establish a robust data management system that ensures FAIR compliance through the entire data lifecycle for experimental and discontinuous remote-sensing products.

Impact: Filled critical gaps in the accessibility and reusability of high-value remote sensing data, addressing the needs of diverse stakeholders across academia, industry, and government.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| ENVRI Science Cluster + Cross Cluster

RISKY

Challenge: High wildlife mortality from energy and transport infrastructures threatens biodiversity and ecosystem stability.

Solution: An open-access web platform extending the Atlas of Living Australia (ALA) to integrate global wildlife mortality data and analytical tools for assessing and mitigating infrastructure impacts.

Impact: Supports sustainable infrastructure planning to minimise wildlife mortality and reduce biodiversity loss.

CASTAL

Challenge: Fragmented and inaccessible case studies on local sustainability transitions impede comprehensive analysis and policy development.

Solution: a centralised, FAIR-compliant digital repository aggregating over 500 European case studies and their metadata datasets, on sustainability transitions.

Impact: Fostered evidence-based sustainability solutions in local communities and municipalities across Europe.

HiMAGNETOS: High Magnetic Field Open Science

Challenge: Lack of targeted support to address specific requirements to share/access open data of high magnetic field experiments.

Solution: An open central data repository with defined curation policies and uploading procedures, and research data linked to the original experimental proposals, enhancing data quality and usability.

Impact: Fostered culture of Open Science in the domain of high magnetic field research.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| ENVRI Science Cluster + Cross Cluster

AMBCAT

Challenge: Scattered and redundant imaging efforts of amber fossils limit collaborative research and data accessibility.

Solution: Centralise high-resolution digital scans of amber fossils into an accessible, FAIR-compliant (meta-)data catalogue with visualisation tools.

Impact: Enhanced interdisciplinary research and public engagement through comprehensive access to digitised amber fossil (meta-)data.

SemantyFish

Challenge: FishBase's current structure limits interoperability and integration with other RIs.

Solution: Transform FishBase into a semantic web knowledge base using standardized vocabularies and ontologies.

Impact: Enhanced data discoverability and integration, supporting interdisciplinary research in fisheries, biodiversity, and environmental sciences

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data | ENVRI Science Cluster

FAIR-EO

Challenge: Fragmented and non-standardized Earth Observation (EO) data hinder AI integration and cross-domain collaboration.

Solution: Develop AI4EOhub – an integrated FAIR-compliant repository providing pre-processed, standardised, and annotated Earth Observation datasets optimised for AI applications, alongside standard AI methods and pre-trained models.

Impact: Enhanced sustainable research practices, aligning with the 'Green AI' initiative, encouraging interdisciplinary research.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| ENVRI Science Cluster

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FAIRFUN4Biodiversity

Challenge: Many protein-coding genes, especially in non-model organisms, lack functional annotation, limiting our understanding of biodiversity.

Solution: FANTASIA, an AI-driven pipeline using natural language processing to predict gene functions, enhancing annotation coverage.

Impact: Advanced biodiversity genomics by providing FAIR, open-access functional data, fostering cross-domain collaboration and Open Science practices.

RSOTC - The Regional State of the Climate dashboard

Challenge: Existing climate reports lack regional detail and often do not follow FAIR principles, limiting reproducibility and detailed analysis.

Solution: Create a web-based dashboard providing near-real-time, FAIR-compliant climate data visualisations and statistical tools at regional levels.

Impact: Empowered researchers and policymakers with detailed, reproducible climate insights, supporting informed decision-making and collaborative research.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| ENVRI Science Cluster + Cross Cluster

FIESTA
FAIR data analysis across sciences

Challenge: Fragmented image analysis practices across scientific communities hinder collaboration and data reuse.

Solution: The project will develop reusable image analysis workflows that can be shared across disciplines such as bioimaging, environmental sciences, and astrophysics.

Impact: Enhanced scientific research and innovation, increased adoption of workflow management systems, and enhanced data compatibility across domains.

CODEMETASOFT

Challenge: Lack of data standards makes solar data siloed and difficult to integrate into broader astrophysical and heliophysics research.

Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing.

Impact: Seamless access to solar observations and simulations data.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| ENVRI Science Cluster

Open and FAIR Integrated Phenology Monitoring System

Challenge: Traditional phenology monitoring relies on outdated equipment and lacks standardisation, hindering FAIR compliance.

Solution: A new phenological camera with open protocols, coupled with a comprehensive post-processing software platform using OS and FAIR data practices.

Impact: Enhanced real-time phenology monitoring, citizen science engagement, and standardised data sharing across RIs.

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HOMEROS

Challenge: Disparate and non-standardized hazard data impede effective multi-hazard assessments in regions like Greece.

Solution: By comparing multi-hazard environments in Greece, HOMEROS will identify network and data needs crucial for improving earth observation and hazard assessment capabilities.

Impact: Advanced scientific knowledge in multi-hazard assessment, to catalyse significant changes in disaster preparedness, response strategies, and recovery processes.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| ENVRI Science Cluster + Cross Cluster

AQUANAVI

Challenge: Limited integration of aquatic RIs hampers comprehensive studies on aquatic ecosystems.

Solution: An open and FAIR interactive atlas integrating technical information and geolocation of aquatic mesocosm facilities worldwide with respective publications and reports.

Impact: Increased reusability and interoperability of existing data collections and better exploration of existing RIs in the future.

OSPARK Bootcamp

Challenge: Limited awareness of Research Infrastructures (RIs) and Open Science services hampers their utilisation.

Solution: Implement a multi-week bootcamp providing evidence-based marketing and communication training to Open Science advocates.

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Challenge: FishBase's current structure limits interoperability and integration with other RIs.

Solution: Transform FishBase into a semantic web knowledge base using standardized vocabularies and ontologies.

Impact: Enhanced data discoverability and integration, supporting interdisciplinary research in fisheries, biodiversity, and environmental sciences

Funded by the European Union


ESCAPE
Astronomy, Nuclear and Particle
Physics

OSCARS
Open Science Clusters' Action for Research & Society

Repositories | ESCAPE Science Cluster + Cross-Cluster

FSD - Federation of Solar Data

Challenge: Lack of data standards makes solar data siloed and difficult to integrate into broader astrophysical and heliophysics research.

Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing, towards integration into a shared globally accessible framework.

Impact: Improved seamless access to solar observations and simulations data.

HiMAGNETOS: High Magnetic Field Open Science

Challenge: Lack of targeted support to address specific requirements to share/access open data of high magnetic field experiments.

Solution: An open central data repository with defined curation policies and uploading procedures, and research data linked to the original experimental proposals, enhancing data quality and usability.

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OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data | ESCAPE Science Cluster

ETAP - Einstein Telescope Analysis Portal

Challenge: Lack of framework to ease adoption of research software (RS) metadata, and of automated tools for (meta)data curation.

Solution: Innovative framework to simplify the creation of metadata records and automate the management, enrichment and propagation of RS metadata across RS project files.

Impact: Enhanced quality and consistency of RS metadata across EU.

NAPMIX

Challenge: lack of a unified metadata schema necessary for achieving FAIR datasets.

Solution: Comprehensive cross-domain metadata schema and user interface, integrating existing ontologies and infrastructures.

Impact: Improved data interoperability and FAIRness, cross-domain collaboration advancing OS in experimental physics.

MADDEN

Challenge: Facilitating seamless data discovery and access across multiple RIs for experimental networking.

Solution: Build a multi-RI Data Lake managed with Rucio.

Impact: Enhanced cross-disciplinary research by simplifying data integration and fostering collaboration among scientific communities.

Streamlining Open Data Policies in Rucio

Challenge: Current workflows require duplicating data to third-party systems to make it openly accessible, leading to inefficiencies.

Solution: Embed open data policies directly into Rucio, allowing native management of open data without duplication.

Impact: Reduced storage costs and environmental footprint, promoting efficient and FAIR-compliant data sharing across disciplines.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| ESCAPE Science Cluster

COPLI

Challenge: Lack of automated pipelines hinders utilisation of LOFAR's full capabilities for high-resolution radio imaging.

Solution: A FAIR, interoperable and sustainable processing pipeline for widefield high-resolution LOFAR imaging, capable of running in an automated fashion on large-scale computing infrastructures.

Impact: Enables ultra-deep radio views of the universe, facilitating radio and multi-wavelength astronomical studies.

Astro Dark Matter TSP

Challenge: Absence of shared tools for integrating observational and experimental constraints on dark matter properties.

Solution: New tools for analysing strong gravitational lensing using data from major RIs, providing unique insights into dark matter.

Impact: Support future research across multiple major RIs, including HST, JWST, and NASA's Roman space telescope, while promoting FAIR data principles.

GASPS

Challenge: Difficulty in integrating and cross-referencing star data across vast catalogues, such as Gaia, leading to a lack of FAIRness in these key data.

Solution: Leverage the PySSED tool to analyse and integrate stellar data from multiple catalogues ensuring FAIR data access.

Impact: GASPS will deliver the largest, internally coherent high-fidelity FAIR catalogue of SED derived stellar parameters.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| ESCAPE Science Cluster + Cross Cluster

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OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| ESCAPE Science Cluster + Cross Cluster

OSPARK Bootcamp

Challenge: Limited awareness of Research Infrastructures (RIs) and Open Science services hampers their utilisation.

Solution: Implement a multi-week bootcamp providing evidence-based marketing and communication training to Open Science advocates.

Impact: Increased visibility and effectiveness of Open Science initiatives, including RIs, the Science Clusters, grassroots communities and more.

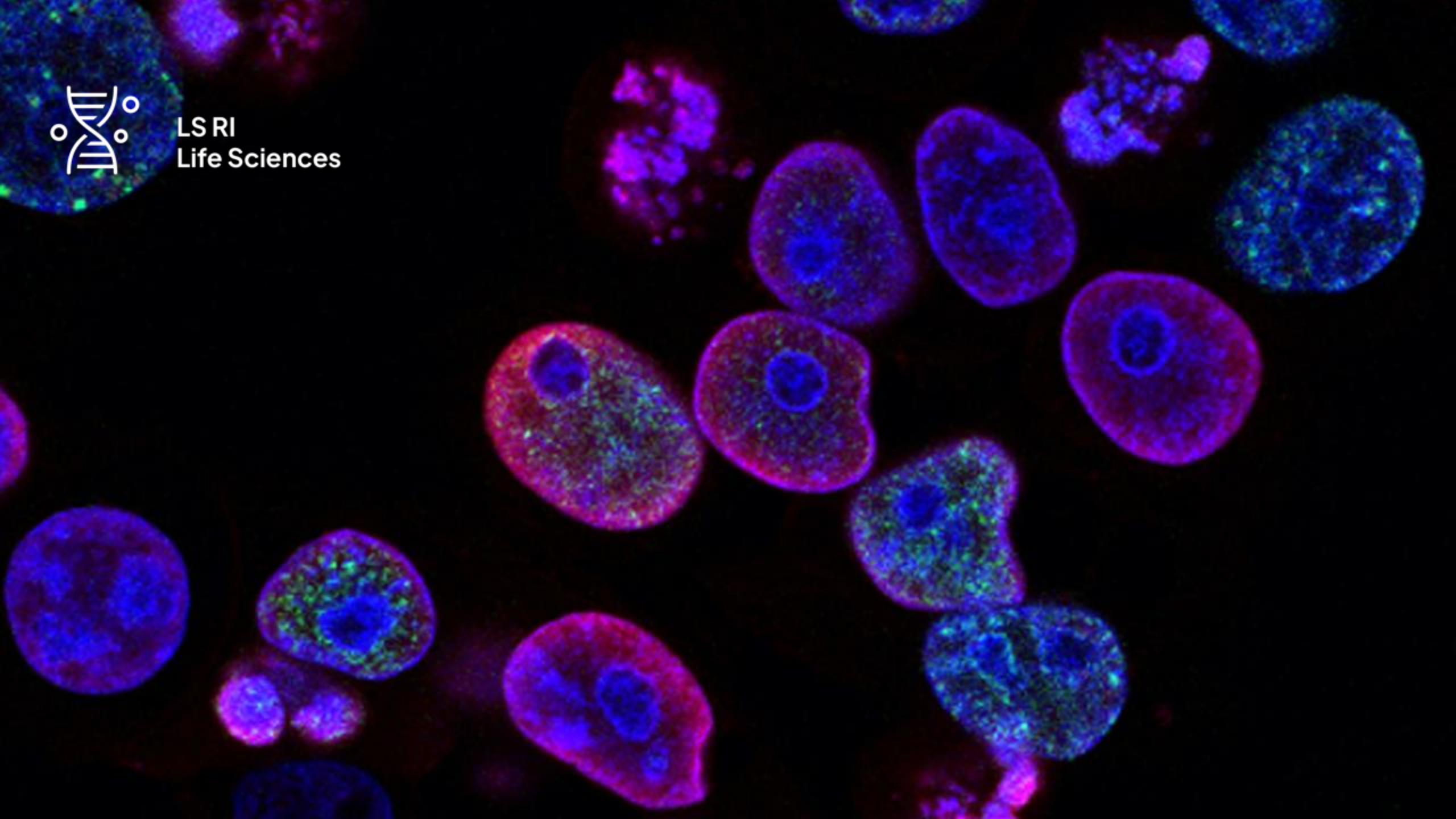
Astro-CC

Challenge: Complexity in managing astronomical data across platforms impedes adherence to FAIR principles.

Solution: Community Competence Centre events engaging experts in astronomical data / service interoperability to prepare and define the scope of a CCC.

Impact: Enhanced data sharing and interoperability across diverse astronomical domains.

Funded by the European Union


LS RI
Life Sciences

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| LS-RI Science Cluster

FAIRY

Challenge: Lack of quantitative gene expression data and incomplete characterisation of yeast species in YEASTRACT+ repository hinder understanding of yeast regulatory networks.

Solution: Integrate quantitative transcriptomics analysis tools and machine learning models into YEASTRACT+, enhancing data FAIRness and interoperability.

Impact: Enhanced data reuse, speeding up research in designing better yeast strains for industry and finding new antifungal drug targets.

FAIRMD

Challenge: Absence of standardised, accessible training data for disordered biomolecules crucial - understand cellular membranes and protein behaviours - limits AI-driven research in biophysics and related fields.

Solution: Expand the NMRlipids Databank to include disordered proteins and develop AI models to predict structural and dynamical properties of disordered biomolecular complexes from atomistic details.

Impact: Enhanced FAIR data sharing and supports and further development of AI-based tools.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| LS-RI Science Cluster + Cross Cluster

RISKY

Challenge: High wildlife mortality from energy and transport infrastructures threatens biodiversity and ecosystem stability.

Solution: An open-access web platform extending the Atlas of Living Australia (ALA) to integrate global wildlife mortality data and analytical tools for assessing and mitigating infrastructure impacts.

Impact: Supports sustainable infrastructure planning to minimise wildlife mortality and reduce biodiversity loss.

AMBCAT

Challenge: Scattered and redundant imaging efforts of amber fossils limit collaborative research and data accessibility.

Solution: Centralise high-resolution digital scans of amber fossils into an accessible, FAIR-compliant (meta-)data catalogue with visualisation tools.

Impact: Enhanced interdisciplinary research and public engagement through comprehensive access to digitised amber fossil (meta-)data.

LabID-PROV

Challenge: Insufficient provenance metadata of datasets derived from primary research limits trust and reproducibility.

Solution: Extend the LabID platform using RO-Crate and WorkflowHub to model and share comprehensive data provenance.

Impact: Enhanced data traceability and FAIR compliance, supporting robust and reproducible scientific research.

SemantyFish

Challenge: FishBase's current structure limits interoperability and integration with other RIs.

Solution: Transform FishBase into a semantic web knowledge base using standardised vocabularies and ontologies.

Impact: Enhanced data discoverability and integration, supporting interdisciplinary research in fisheries, biodiversity, and environmental sciences.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data | LS-RI Science Cluster

Implementing FAIRness in structure-based drug design through Fragalysis Cloud

Challenge: Fragmented and inadequately accessible structure-based drug design (SBDD) data impede transparency and reproducibility.

Solution: Enhance the Fragalysis Cloud platform for curating, sharing and disseminating views of 3D data, to facilitate open and FAIR-compliant sharing of SBDD data.

Impact: Revolutionised accessibility and reuse of SBDD data, providing an innovative tool for examining collective datasets in a FAIR manner.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| LS-RI Science Cluster

PRIVAGAMS

Challenge: Sensitive data in AI models pose privacy risks, hindering open data sharing.

Solution: A platform enabling research institutions to produce high-quality simulated data customised for specific needs, increasing data availability while ensuring privacy remains intact.

Impact: The platform enables institutions to share data more freely without compromising privacy.

BIO-CODES

Challenge: Bioimaging data often lacks standardised identifiers, hindering FAIR compliance and AI integration.

Solution: Implement the ISCC standard - ISO 24138 to generate content-based identifiers for bioimaging datasets, and later integrate it into platforms, such as OMERO to enhance FAIR compliance.

Impact: Improved data integrity and reproducibility, facilitating AI-driven analyses in life sciences.

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Solution: Extend the LabID platform using RO-Crate and WorkflowHub to model and share comprehensive data provenance.

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Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| LS-RI Science Cluster + Cross Cluster

FIESTA
FAIR data analysis across sciences

Challenge: Inconsistent image analysis practices across scientific disciplines impede data interoperability and reuse.

Solution: The project will develop reusable image analysis workflows that can be shared across disciplines such as bioimaging, environmental sciences, and astrophysics.

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CODEMETASOFT

Challenge: Lack of data standards makes solar data siloed and difficult to integrate into broader astrophysical and heliophysics research.

Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing.

Impact: Seamless access to solar observations and simulations data.

HEFTIE

Challenge: Managing and processing extremely large tomographic imaging datasets pose significant technical challenges.

Solution: Develop scalable solutions for efficient handling, storage, and analysis of massive tomographic imaging files.

Impact: Enhanced research capabilities in fields relying on tomographic imaging by streamlining data management processes.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| LS-RI Science Cluster

ARTICYST

Challenge: Limited precision of predictive tools for autosomal dominant polycystic kidney disease (ADPKD) and lack of integration of different data types hinder patient decision-making and treatment planning.

Solution: Develop an open, multicentre data infrastructure integrating clinical, imaging, and proteomic data for advanced predictive modeling.

Impact: Enhanced personalised care in ADPKD. The model is scalable for data-driven research in chronic diseases.

FAIRification of IsoSeq Evidence-driven annotation of the biodiversity

Challenge: Incomplete functional annotation of biodiversity genomic data limits understanding of gene functions, especially in non-model organisms.

Solution: A benchmarked pipeline for long-read-driven genome annotation, designed for seamless integration with existing genome annotation efforts, significantly enhancing the quality of annotations.

Impact: Advanced biodiversity genomics by providing high-quality, FAIR-compliant annotations, facilitating research across various biological disciplines.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| LS-RI Science Cluster + Cross Cluster

AQUANAVI

Challenge: Limited integration of aquatic RIs hampers comprehensive studies on aquatic ecosystems.

Solution: An open and FAIR interactive atlas integrating technical information and geolocation of aquatic mesocosm facilities worldwide with respective publications and reports.

Impact: Increased reusability and interoperability of existing data collections and better exploration of existing RIs in the future.

OSPARK Bootcamp

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Impact: Increased visibility and effectiveness of Open Science initiatives, including RIs, the Science Clusters, grassroots communities and more.

mTess-X

Challenge: Fragmentation of training resources across RIs limits accessibility and reuse.

Solution: Extend the TeSS platform to support multi-tenancy and cross-instance content exchange, enabling federated training catalogues.

Impact: enhance the findability, accessibility, and reuse of high-quality training resources.

Funded by the European Union


PaNOSC
Photon and Neutron Science

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| PaNOSC Science Cluster + Cross Cluster

MatScatNet

Challenge: Scattering data from materials research is dispersed and lacks standardised formats, hindering data sharing and analysis.

Solution: An OS database that consolidates scattering data with standardised metadata and analysis tool.

Impact: Enhanced collaboration among researchers, industries and RIs, with an OS approach supporting innovation in fields such as nanotechnology, energy, and pharma.

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Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data| PaNOSC Science Cluster

AI-SCOPE

Challenge: Lack of well-annotated surface scattering data.

Solution: A sophisticated AI analysis tool for surface scattering experiments that performs an automated initial analysis and simultaneously generates rich metadata annotations.

Impact: A more comprehensive exploration of experimental data towards the discovery of novel materials and to facilitate meta-studies and machine learning applications in materials discovery.

CDIF-4-XAS

Challenge: X-ray absorption spectroscopy (XAS) data lacks standardised formats, impeding cross-disciplinary utilisation.

Solution: Develop a common data infrastructure framework (CDIF) to standardise XAS data description and sharing.

Impact: Enabled seamless integration and reuse of XAS data across various scientific domains, fostering collaborative research.

MC-ReDD

Challenge: Methods for handling raw data lack standardisation, hindering transparent communication between researchers, as well as trust and data reuse across disciplines.

Solution: A tool for semi or fully automatic construction of imgCIF files from raw data sets, to transparently communicate rich information about raw data in a standardised, robust, machine-readable fashion.

Impact: enhanced interoperability and reusability of raw diffraction data across scientific domains.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data| PaNOSC Science Cluster + Cross-Cluster

Findable Big Data from Various Material Characterisation Techniques

Challenge: Experimental datasets across PaN facilities are abundant but difficult to find due to fragmented metadata and lack of semantic standardisation

Solution: Integrate and refine the PaNET ontology with NeXus and ESRF-ET ontologies, embedding them into platforms like NOMAD to enhance semantic clarity and dataset discoverability.

Impact: Improved data findability and interoperability of experimental data across diverse materials characterisation techniques.

SHARE

Challenge: Synchrotron X-ray data in heritage science is often inaccessible, limiting reuse and interdisciplinary research

Solution: an easily searchable database of over 1,600 datasets from synchrotron analysis on art objects and model samples providing easy access to raw and processed data, and metadata.

Impact: Enhanced data accessibility and reuse in heritage science, promoting FAIR principles and facilitating cross-disciplinary research collaborations.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools | PaNOSC Science Cluster + Cross Cluster

VISA

Challenge: Growing volume of experimental data and increasing complexity of data processing.

Solution: maintain and optimise VISA – Virtual Infrastructure for Scientific Analysis, enhancing user experience by integrating various scientific data repositories and analysis tools.

Impact: Enhanced data accessibility and collaboration across scientific disciplines by providing a centralised analysis infrastructure.

PaN-Finder

Challenge: In the PaNOSC Data Portal, the key challenge lies in improving user interaction and data retrieval efficiency, enabling a wider range of users to navigate the expansive knowledge base effectively.

Solution: Enhance the capabilities of the existing PaNOSC Data Portal, introducing an AI-powered search tool that simplifies user interaction.

Impact: Enhanced adoption of the PaNOSC Data Portal, and improved data findability, accessibility and reuse.

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Promotion of Open Science| PaNOSC Science Cluster + Cross Cluster

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OSCARS
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Repositories| SSHOC Science Cluster

EHRI-KG

Challenge: Fragmented Holocaust data across archives hinders comprehensive research.

Solution: A comprehensive Linked Open Data (LOD) Knowledge Graph (KG) aligning with evolving semantic web standards.

Impact: enhanced cohesion within Holocaust research, promoting new patterns of exploration and discovery, while enhancing data reuse, interoperability, and accessibility.

CASTAL

Challenge: Fragmented and inaccessible case studies on local sustainability transitions impede comprehensive analysis and policy development.

Solution: a centralised, FAIR-compliant digital repository aggregating over 500 European case studies and their metadata datasets, on sustainability transitions.

Impact: Fostered evidence-based sustainability solutions in local communities and municipalities across Europe.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data| SSHOC Science Cluster

ONTOLISST

Challenge: lack of widely used, streamlined, multilingual tools to assign topics and concepts to surveys on variable level across social scientific data from various archives, which impedes data discoverability and accessibility.

Solution: Develop the Light Social Science Thesaurus (LiSST) and apply NLP for cross-language topic annotation.

Impact: Fostered interoperability across RIs, and enhanced discoverability of data for diverse users.

ParlaCAP

Challenge: Lack of structured, comparable data on parliamentary agendas across Europe.

Solution: Utilise advanced text-as-data methods to analyse +7mln speeches from 27 parliaments, coding topics and sentiments to create a structured, FAIR dataset.

Impact: Revolutionised comparative parliamentary studies by providing a robust dataset for tracking political agenda-setting across European parliaments.

HarDIS

Challenge: Fragmented political party and voter data hinder comprehensive democracy studies.

Solution: A scalable and community-driven framework for FAIR and sustainable linkage key databases integrating diverse political datasets.

Impact: Supported in-depth analysis of political representation and voter-party dynamics across Europe.

Funded by the European Union

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Data Annotation and Type of Data| SSHOC Science Cluster + Cross Cluster

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Impact: Enhanced data accessibility and reuse in heritage science, promoting FAIR principles and facilitating cross-disciplinary research collaborations.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| SSHOC Science Cluster

Opravidlo 2.0 – Public online proofreading service

Challenge: Existing Czech spellcheckers lack robustness and adaptability to modern language use.

Solution: Integrate AI with expert linguistic rules, making efforts to improve recall while maintaining precision.

Impact: Opravidlo 2.0 contributes to OS by publishing its grammar rules and anonymised corrected texts via CLARIN. This will enable linguistic analysis, teaching, and tool development across languages with similar orthography systems.

AMIS

Challenge: Metadata enrichment in digital humanities is often a manual, time-consuming task lacking open services that support the large-scale creation of quality metadata.

Solution: An innovative web application specifically designed for humanities researchers, focusing on text analysis for metadata enrichment.

Impact: Enhanced metadata quality and coherence, towards the convergence of conceptual models in text description and analysis within cultural studies and other SSH disciplines.

Funded by
the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| SSHOC Science Cluster + Cross Cluster

OASIS - Open Audiovisual Science Innovation Scheme

Challenge: Challenges in analyzing and sharing audiovisual research materials due to format and copyright issues.

Solution: An active network that brings together researchers from different European countries who are managing and working on online video corpora, as well as open-source and interoperable tools tailored for audiovisual corpora.

Impact: Facilitates open, FAIR-compliant audiovisual research across humanities and social sciences.

FASCA

Challenge: Traditional research methods often fall short of leveraging the full potential of large datasets and diverse research outputs.

Solution: Implement the GoTriple pipeline to standardise and analyse multilingual scholarly metadata.

Impact: Allows the SSH community to build cross-disciplinary collaborations between SSHOC and other EOSC Thematic Clusters thanks to shared background of data-driven methodologies.

CODEMETASOFT

Challenge: Lack of data standards makes solar data siloed and difficult to integrate into broader astrophysical and heliophysics research.

Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing.

Impact: Seamless access to solar observations and simulations data.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Promotion of Open Science| SSHOC Science Cluster + Cross Cluster

DracOrOS

Challenge: The DraCor drama corpora platform, the main hub for data-driven research on European drama and a community-based competence centre for Computational Literary Studies, is not fully committed to OS principles.

Solution: Develop the DraCor Open Knowledge Graph and integrate it with EOSC services via APIs. Release DraCor as an adaptable open-source tool for broader reuse.

Impact: Strengthened OS in Computational Drama Analysis and enhances research reproducibility and interoperability.

FASCA

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OSPARK Bootcamp

Challenge: Limited awareness of RIs and Open Science services hampers their utilisation.

Solution: Implement a multi-week bootcamp providing evidence-based marketing and communication training to Open Science advocates.

Impact: Increased visibility and effectiveness of Open Science initiatives, including RIs, the Science Clusters, grassroots communities and more.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Repositories| Cross Cluster

CASTAL

Challenge: Fragmented and inaccessible case studies on local sustainability transitions impede comprehensive analysis and policy development.

Solution: a centralised, FAIR-compliant digital repository aggregating over 500 European case studies and their metadata datasets, on sustainability transitions.

Impact: Fostered evidence-based sustainability solutions in local communities and municipalities across Europe.

RISKY

Challenge: High wildlife mortality from energy and transport infrastructures threatens biodiversity and ecosystem stability.

Solution: An open-access web platform extending the Atlas of Living Australia (ALA) to integrate global wildlife mortality data and analytical tools for assessing and mitigating infrastructure impacts.

Impact: Supports sustainable infrastructure planning to minimise wildlife mortality and reduce biodiversity loss.

SemantyFish

Challenge: FishBase's current structure limits interoperability and integration with other RIs.

Solution: Transform FishBase into a semantic web knowledge base using standardized vocabularies and ontologies.

Impact: Enhanced data discoverability and integration, supporting interdisciplinary research in fisheries, biodiversity, and environmental sciences.

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Repositories| Cross Cluster

AMBCAT

Challenge: Scattered and redundant imaging efforts of amber fossils limit collaborative research and data accessibility.

Solution: Centralise high-resolution digital scans of amber fossils into an accessible, FAIR-compliant (meta-)data catalogue with visualisation tools.

Impact: Enhanced interdisciplinary research and public engagement through comprehensive access to digitised amber fossil (meta-)data.

HiMAGNETOS: High Magnetic Field Open Science

Challenge: Lack of targeted support to address specific requirements to share/access open data of high magnetic field experiments.

Solution: An open central data repository with defined curation policies and uploading procedures, and research data linked to the original experimental proposals, enhancing data quality and usability.

Impact: Fostered culture of Open Science in the domain of high magnetic field research.

ioChem-BD

Challenge: In the realms of computational chemistry and materials science, there is a pressing need to address the fragmented landscape of research data.

Solution: A robust platform that promotes FAIR data practices. By integrating Semantics Data Models into the repository, ioChem-BD ensures that data from various origins can be analysed collectively.

Impact: Enhanced data reuse and collaboration, accelerating discoveries in chemistry and materials science.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Data Annotation and Type of Data| Cross Cluster + Other

SHARE

Challenge: Synchrotron X-ray data in heritage science is often inaccessible, limiting reuse and interdisciplinary research.

Solution: An easily searchable database of over 1,600 datasets from synchrotron analysis on art objects and model samples providing easy access to raw and processed data, and metadata.

Impact: Enhanced data accessibility and reuse in heritage science, promoting FAIR principles and facilitating cross-disciplinary research collaborations.

Findable Big Data from Various Material Characterisation Techniques

Challenge: Experimental datasets across PaN facilities are abundant but difficult to find due to fragmented metadata and lack of semantic standardisation.

Solution: Integrate and refine the PaNET ontology with NeXus and ESRF-ET ontologies, embedding them into platforms like NOMAD to enhance semantic clarity and dataset discoverability.

Impact: Improved data findability and interoperability of experimental data across diverse materials characterisation techniques.

OpenCorrAM

Challenge: Corrosion data in metal additive manufacturing (MAM) is fragmented, hindering predictive modeling and material optimisation.

Solution: An open and comprehensive database of intercorrelated results in the different fields of MAM performance analysis, that catalogues the corrosion characteristics of various additively manufactured materials.

Impact: Standardised methods and approaches in corrosion studies on AM materials.

Funded by the European Union

OSCARS
Open Science Clusters' Action for Research & Society

Software, AI and Tools| Cross Cluster

HEFTIE

Challenge: Managing and processing extremely large tomographic imaging datasets pose significant technical challenges.

Solution: Develop scalable solutions for efficient handling, storage, and analysis of massive tomographic imaging files.

Impact: Enhanced research capabilities in fields relying on tomographic imaging by streamlining data management processes.

FIESTA
FAIR data analysis across sciences

Challenge: Fragmented image analysis practices across scientific communities hinder collaboration and data reuse.

Solution: The project will develop reusable image analysis workflows that can be shared across disciplines such as bioimaging, environmental sciences, and astrophysics.

Impact: Enhanced scientific research and innovation, increased adoption of workflow management systems, and enhanced data compatibility across domains.

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Promotion of Open Science | Cross Cluster

AQUANAVI

Challenge: Limited integration of aquatic RIs hampers comprehensive studies on aquatic ecosystems.

Solution: An open and FAIR interactive atlas integrating technical information and geolocation of aquatic mesocosm facilities worldwide with respective publications and reports.

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Solution: Extend the TeSS platform to support multi-tenancy and cross-instance content exchange, enabling federated training catalogues.

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Promotion of Open Science| Other

PNU-OpenLab

Challenge: Need for consolidating Ukraine's scientific research efforts in advanced materials and nanomaterials.

Solution: Establish the PNU-OpenLab as a leading centre for collaboration, open data sharing, and advanced materials and nanomaterials research.

Impact: Facilitate the certification of the PNU-NanoLab, enabling it to deliver accredited materials and data analysis services.

Funded by the European Union

REPOSITORIES

EVA-FAIR

Challenge: Inconsistent metadata and data formats hinder the reuse and integration of vegetation data across Europe.

Solution: Develop standardised workflows and tools to move European Vegetation Archive (EVA) data towards open access, publishing them in trusted and FAIR-compliant repositories.

Impact: Enhanced data interoperability and accessibility, supporting ecological research and biodiversity conservation efforts.

GOYAS

Challenge: Remote sensing datasets often lack comprehensive metadata, limiting their reproducibility and reuse.

Solution: Establish a robust data management system that ensures FAIR compliance through the entire data lifecycle for experimental and discontinuous remote-sensing products.

Impact: Filled critical gaps in the accessibility and reusability of high-value remote sensing data, addressing the needs of diverse stakeholders across academia, industry, and government.

FSD - Federation of Solar Data

Challenge: Lack of data standards makes solar data siloed and difficult to integrate into broader astrophysical and heliophysics research.

Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing, towards integration into a shared globally accessible framework.

Impact: Improved seamless access to solar observations and simulations data.

FAIRY

Challenge: Lack of quantitative gene expression data and incomplete characterisation of yeast species in YEASTRACT+ repository hinder understanding of yeast regulatory networks.

Solution: Integrate quantitative transcriptomics analysis tools and machine learning models into YEASTRACT+, enhancing data FAIRness and interoperability.

Impact: Enhanced data reuse, speeding up research in designing better yeast strains for industry and finding new antifungal drug targets.

FAIRMD

Challenge: Absence of standardised, accessible training data for disordered biomolecules crucial - understand cellular membranes and protein behaviours - limits AI-driven research in biophysics and related fields.

Solution: Expand the NMRlipids Databank to include disordered proteins and develop AI models to predict structural and dynamical properties of disordered biomolecular complexes from atomistic details.

Impact: Enhanced FAIR data sharing and supports and further development of AI-based tools.

EHRI-KG

Challenge: Fragmented Holocaust data across archives hinders comprehensive research.

Solution: A comprehensive Linked Open Data (LOD) Knowledge Graph (KG) aligning with evolving semantic web standards.

Impact: enhanced cohesion within Holocaust research, promoting new patterns of exploration and discovery, while enhancing data reuse, interoperability, and accessibility.

MatScatNet

Challenge: Scattering data from materials research is dispersed and lacks standardised formats, hindering data sharing and analysis.

Solution: An OS database that consolidates scattering data with standardised metadata and analysis tool.

Impact: Enhanced collaboration among researchers, industries and RIs, with an OS approach supporting innovation in fields such as nanotechnology, energy, and pharma.

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Challenge: High wildlife mortality from energy and transport infrastructures threatens biodiversity and ecosystem stability.

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LabID-PROV

Challenge: Insufficient provenance metadata of datasets derived from primary research limits trust and reproducibility.

Solution: Extend the LabID platform using RO-Crate and WorkflowHub to model and share comprehensive data provenance.

Impact: Enhanced data traceability and FAIR compliance, supporting robust and reproducible scientific research.

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Impact: Enhanced data reuse and collaboration, accelerating discoveries in chemistry and materials science.

DATA ANNOTATION and TYPE of DATA

ETAP - Einstein Telescope Analysis Portal

Challenge: Lack of framework to ease adoption of research software (RS) metadata, and of automated tools for (meta)data curation.

Solution: Innovative framework to simplify the creation of metadata records and automate the management, enrichment and propagation of RS metadata across RS project files.

Impact: Enhanced quality and consistency of RS metadata across EU.

NAPMIX

Challenge: lack of a unified metadata schema necessary for achieving FAIR datasets.

Solution: Comprehensive cross-domain metadata schema and user interface, integrating existing ontologies and infrastructures.

Impact: Improved data interoperability and FAIRness, cross-domain collaboration advancing OS in experimental physics.

MADDEN

Challenge: Facilitating seamless data discovery and access across multiple RIs for experimental networking.

Solution: Build a multi-RI Data Lake managed with Rucio.

Impact: Enhanced cross-disciplinary research by simplifying data integration and fostering collaboration among scientific communities.

Streamlining Open Data Policies in Rucio

Challenge: Current workflows require duplicating data to third-party systems to make it openly accessible, leading to inefficiencies.

Solution: Embed open data policies directly into Rucio, allowing native management of open data without duplication.

Impact: Reduced storage costs and environmental footprint, promoting efficient and FAIR-compliant data sharing across disciplines.

FAIR-EO

Challenge: Fragmented and non-standardized Earth Observation (EO) data hinder AI integration and cross-domain collaboration.

Solution: Develop AI4EOhub – an integrated FAIR-compliant repository providing pre-processed, standardised, and annotated Earth Observation datasets optimised for AI applications, alongside standard AI methods and pre-trained models.

Impact: Enhanced sustainable research practices, aligning with the 'Green AI' initiative, encouraging interdisciplinary research.

Implementing FAIRness in structure-based drug design through Fragalysis Cloud

Challenge: Fragmented and inadequately accessible structure-based drug design (SBDD) data impede transparency and reproducibility.

Solution: Enhance the Fragalysis Cloud platform for curating, sharing and disseminating views of 3D data, to facilitate open and FAIR-compliant sharing of SBDD data.

Impact: Revolutionised accessibility and reuse of SBDD data, providing an innovative tool for examining collective datasets in a FAIR manner.

AI-Scope

Challenge: Lack of well-annotated surface scattering data.

Solution: A sophisticated AI analysis tool for surface scattering experiments that performs an automated initial analysis and simultaneously generates rich metadata annotations.

Impact: A more comprehensive exploration of experimental data towards the discovery of novel materials and to facilitate meta-studies and machine learning applications in materials discovery.

CDIF-4-XAS

Challenge: X-ray absorption spectroscopy (XAS) data lacks standardised formats, impeding cross-disciplinary utilisation.

Solution: Develop a common data infrastructure framework (CDIF) to standardise XAS data description and sharing.

Impact: Enabled seamless integration and reuse of XAS data across various scientific domains, fostering collaborative research.

MC-ReDD

Challenge: Methods for handling raw data lack standardisation, hindering transparent communication between researchers, as well as trust and data reuse across disciplines.

Solution: A tool for semi or fully automatic construction of imgCIF files from raw data sets, to transparently communicate rich information about raw data in a standardised, robust, machine-readable fashion.

Impact: enhanced interoperability and reusability of raw diffraction data across scientific domains.

Findable Big Data from Various Material Characterisation Techniques

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Solution: Integrate and refine the PaNET ontology with NeXus and ESRF-ET ontologies, embedding them into platforms like NOMAD to enhance semantic clarity and dataset discoverability.

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Solution: an easily searchable database of over 1,600 datasets from synchrotron analysis on art objects and model samples providing easy access to raw and processed data, and metadata.

Impact: Enhanced data accessibility and reuse in heritage science, promoting FAIR principles and facilitating cross-disciplinary research collaborations.

ONTOLISST

Challenge: lack of widely used, streamlined, multilingual tools to assign topics and concepts to surveys on variable level across social scientific data from various archives, which impedes data discoverability and accessibility.

Solution: Develop the Light Social Science Thesaurus (LiSST) and apply NLP for cross-language topic annotation.

Impact: Fostered interoperability across RIs, and enhanced discoverability of data for diverse users.

ParlaCAP

Challenge: Lack of structured, comparable data on parliamentary agendas across Europe.

Solution: Utilise advanced text-as-data methods to analyse +7mln speeches from 27 parliaments, coding topics and sentiments to create a structured, FAIR dataset.

Impact: Revolutionised comparative parliamentary studies by providing a robust dataset for tracking political agenda-setting across European parliaments.

HarDIS

Challenge: Fragmented political party and voter data hinder comprehensive democracy studies.

Solution: A scalable and community-driven framework for FAIR and sustainable linkage key databases integrating diverse political datasets.

Impact: Supported in-depth analysis of political representation and voter-party dynamics across Europe.

SOFTWARE, AI and TOOLS

PRIVAGAMS

Challenge: Sensitive data in AI models pose privacy risks, hindering open data sharing.

Solution: A platform enabling research institutions to produce high-quality simulated data customised for specific needs, increasing data availability while ensuring privacy remains intact.

Impact: The platform enables institutions to share data more freely without compromising privacy.

BIO-CODES

Challenge: Bioimaging data often lacks standardised identifiers, hindering FAIR compliance and AI integration.

Solution: Implement the ISCC standard - ISO 24138 to generate content-based identifiers for bioimaging datasets, and later integrate it into platforms, such as OMERO to enhance FAIR compliance.

Impact: Improved data integrity and reproducibility, facilitating AI-driven analyses in life sciences.

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Challenge: Insufficient provenance metadata of datasets derived from primary research limits trust and reproducibility.

Solution: Extend the LabID platform using RO-Crate and WorkflowHub to model and share comprehensive data provenance.

Impact: Enhanced data traceability and FAIR compliance, supporting robust and reproducible scientific research.

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Solution: A robust data management system ensuring FAIR compliance through the entire data lifecycle for experimental and discontinuous remote-sensing products.

Impact: Filled critical gaps in the accessibility and reusability of high-value remote sensing data, addressing the needs of diverse stakeholders across academia, industry, and government.

FAIRFUN4Biodiversity

Challenge: Many protein-coding genes, especially in non-model organisms, lack functional annotation, limiting our understanding of biodiversity.

Solution: FANTASIA, an AI-driven pipeline using natural language processing to predict gene functions, enhancing annotation coverage.

Impact: Advanced biodiversity genomics by providing FAIR, open-access functional data, fostering cross-domain collaboration and Open Science practices.

RSOTC - The Regional State of the Climate dashboard

Challenge: Existing climate reports lack regional detail and often do not follow FAIR principles, limiting reproducibility and detailed analysis.

Solution: Create a web-based dashboard providing near-real-time, FAIR-compliant climate data visualisations and statistical tools at regional levels.

Impact: Empowered researchers and policymakers with detailed, reproducible climate insights, supporting informed decision-making and collaborative research.

COPLI

Challenge: Lack of automated pipelines hinders utilisation of LOFAR's full capabilities for high-resolution radio imaging.

Solution: A FAIR, interoperable and sustainable processing pipeline for widefield high-resolution LOFAR imaging, capable of running in an automated fashion on large-scale computing infrastructures.

Impact: Enables ultra-deep radio views of the universe, facilitating radio and multi-wavelength astronomical studies.

GASPS

Challenge: Difficulty in integrating and cross-referencing star data across vast catalogues, such as Gaia, leading to a lack of FAIRness in these key data.

Solution: Leverage the PySSED tool to analyse and integrate stellar data from multiple catalogues ensuring FAIR data access.

Impact: GASPS will deliver the largest, internally coherent high-fidelity FAIR catalogue of SED derived stellar parameters.

Astro Dark Matter TSP

Challenge: Absence of shared tools for integrating observational and experimental constraints on dark matter properties.

Solution: New tools for analysing strong gravitational lensing using data from major RIs, providing unique insights into dark matter.

Impact: Support future research across multiple major RIs, including HST, JWST, and NASA's Roman space telescope, while promoting FAIR data principles.

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VISA

Challenge: Growing volume of experimental data and increasing complexity of data processing.

Solution: maintain and optimise VISA – Virtual Infrastructure for Scientific Analysis, enhancing user experience by integrating various scientific data repositories and analysis tools.

Impact: Enhanced data accessibility and collaboration across scientific disciplines by providing a centralised analysis infrastructure.

PaN-Finder

Challenge: In the PaNOSC Data Portal, the key challenge lies in improving user interaction and data retrieval efficiency, enabling a wider range of users to navigate the expansive knowledge base effectively.

Solution: Enhance the capabilities of the existing PaNOSC Data Portal, introducing an AI-powered search tool that simplifies user interaction.

Impact: Enhanced adoption of the PaNOSC Data Portal, and improved data findability, accessibility and reuse.

OASIS - Open Audiovisual Science Innovation Scheme

Challenge: Existing Czech spellcheckers lack robustness and adaptability to modern language use.

Solution: Integrate AI with expert linguistic rules, making efforts to improve recall while maintaining precision.

Impact: Opravidlo 2.0 contributes to OS by publishing its grammar rules and anonymised corrected texts via CLARIN. This will enable linguistic analysis, teaching, and tool development across languages with similar orthography systems.

FASCA

Challenge: Traditional research methods often fall short of leveraging the full potential of large datasets and diverse research outputs.

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AMIS

Challenge: Metadata enrichment in digital humanities is often a manual, time-consuming task lacking open services that support the large-scale creation of quality metadata.

Solution: An innovative web application specifically designed for humanities researchers, focusing on text analysis for metadata enrichment.

Impact: Enhanced metadata quality and coherence, towards the convergence of conceptual models in text description and analysis within cultural studies and other SSH disciplines.

HEFTIE

Challenge: Managing and processing extremely large tomographic imaging datasets pose significant technical challenges.

Solution: Develop scalable solutions for efficient handling, storage, and analysis of massive tomographic imaging files.

Impact: Enhanced research capabilities in fields relying on tomographic imaging by streamlining data management processes.

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Challenge: Inconsistent image analysis practices across scientific disciplines impede data interoperability and reuse.

Solution: The project will develop reusable image analysis workflows that can be shared across disciplines such as bioimaging, environmental sciences, and astrophysics.

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Solution: FAIRification of existing solar datasets and archives with advanced tools for data archiving, curation and sharing.

Impact: Seamless access to solar observations and simulations data.

PROMOTION of OPEN SCIENCE

Open and FAIR Integrated Phenology Monitoring System

Challenge: Traditional phenology monitoring relies on outdated equipment and lacks standardisation, hindering FAIR compliance.

Solution: A new phenological camera with open protocols, coupled with a comprehensive post-processing software platform using OS and FAIR data practices.

Impact: Enhanced real-time phenology monitoring, citizen science engagement, and standardised data sharing across RIs.

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HOMEROS

Challenge: Disparate and non-standardized hazard data impede effective multi-hazard assessments in regions like Greece.

Solution: By comparing multi-hazard environments in Greece, HOMEROS will identify network and data needs crucial for improving earth observation and hazard assessment capabilities.

Impact: Advanced scientific knowledge in multi-hazard assessment, to catalyse significant changes in disaster preparedness, response strategies, and recovery processes.

ARTICYST

Challenge: Limited precision of predictive tools for autosomal dominant polycystic kidney disease (ADPKD) and lack of integration of different data types hinder patient decision-making and treatment planning.

Solution: Develop an open, multicentre data infrastructure integrating clinical, imaging, and proteomic data for advanced predictive modeling.

Impact: Enhanced personalised care in ADPKD. The model is scalable for data-driven research in chronic diseases.

FAIRification of IsoSeq Evidence-driven annotation of the biodiversity

Challenge: Incomplete functional annotation of biodiversity genomic data limits understanding of gene functions, especially in non-model organisms.

Solution: A benchmarked pipeline for long-read-driven genome annotation, designed for seamless integration with existing genome annotation efforts, significantly enhancing the quality of annotations.

Impact: Advanced biodiversity genomics by providing high-quality, FAIR-compliant annotations, facilitating research across various biological disciplines.

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OSCARS
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