Open science in the European Research Area (ERA)

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European Research Area (ERA)

ERA is a joint endeavour for research, innovation and technology

- **By European Commission, Council of the European Union**, and **27 EU Member States**

- **Open science is one of the cross-cutting issues in ERA**:
  - Aligned policies
  - Interoperable infrastructures (e-infrastructures, research infrastructures, EOSC and national open science clouds)
  - Computing and storage of open data (also using supercomputers)
  - Support and training
  - Reform of research assessment
  - Copyright reform in support of open science

Information on open science in EU Member States

Key open science policies/legislation in ERA

- **Commission** communication A new ERA for Research and Innovation, 2020
- **Commission** recommendation on a European strategy for universities, 2022
- **Council** conclusions on the New European Research Area, 2020
- **Council** conclusions on the European Universities initiative - Bridging higher education, research, innovation and society: paving the way for a new dimension in European higher education, 2021
- **Council** conclusions on research assessment and implementation of Open Science, 2022

Slovenia: legislative provisions on open science fully aligned with Horizon Europe

- Scientific Research and Innovation Activities Act (blogpost), 2021
- Slovenian Scientific Research and Innovation Strategy 2030 (blogpost), 2022
- Research Infrastructure Roadmap 2030, 2022

ERA: Main challenges and priorities for Open Science

Improve the practice of research and innovation

- Openly accessible scholarly publications
- Early sharing of all research outputs
- All data FAIR, RDM
- Reproducible results
- Societal engagement and responsibility

Develop proper enablers

- Rewards and incentives to adopt Open Science practices, with appropriate metrics
- Appropriate skills and education, including for research integrity
- Open Research Infrastructures including the European Open Science Cloud (EOSC)

Involving all the actors   *Engaging internationally*

Changing research culture

European Commission

Slide from Kostas Glinos: Open Science: The new normal for practising science?, 9. 6. 2021

Open science default around the globe: aligned provisions on immediate open access to research results

- 27 countries in ERA: previous slides

BUT ALSO:

- 192 countries: [UNESCO recommendation on open science](#), 2021

- USA: [White House Office of Science, Technology and Policy: Ensuring Free, Immediate, and Equitable Access to Federally Funded Research](#), 2022

Tribute to [cOAlition S](#) (2018) for its global influence

Science Europe, national, charitable and international funders, supported by European Commission

Part I: The Plan S Principles

"With effect from 2021*, all scholarly publications on the results from research funded by public or private grants provided by national, regional and international research councils and funding bodies, must be published in Open Access Journals, on Open Access Platforms, or made immediately available through Open Access Repositories without embargo."

*For funders agreeing after January 2020 to implement Plan S in their policies, the start date will be one year from that agreement

In addition:

01 Authors or their institutions retain copyright to their publications. All publications must be published under an open license, preferably the Creative Commons Attribution license

06 The Funders encourage governments, universities, research organisations, libraries, academies, and learned societies to align their strategies, policies, and practices, notably to ensure

Provisions on open science by the EU funders

Horizon Europe Programme Guide:
Mandatory open science practices

o **open access to scientific publications** under the conditions required by the grant agreement;

o responsible **management of research data in line with the FAIR principles** of 'Findability', 'Accessibility', 'Interoperability' and 'Reusability', notably through the generalised use of **data management plans**, and open access to research data under the principle **'as open as possible,** as closed as necessary', under the conditions required by the grant agreement;

o **information about the research outputs/tools/instruments needed to validate** the conclusions of scientific publications or to validate/re-use research data;

o digital or physical access to the results needed to validate the conclusions of scientific publications, unless exceptions apply;

o in cases of public emergency, if requested by the granting authority, immediate open access to all research outputs under open licenses or, if exceptions apply, access under fair and reasonable conditions to legal entities that need the research outputs to address the public emergency[16].

Horizon Europe Programme Guide: **Recommended open science practices**

- Early and open sharing of research (preregistration, registered reports, preprints)

- Output management beyond research data (software, models, algorithms, processes, protocols …)

- Open peer-review

- Involving all relevant knowledge actors, including citizens: citizen, civil society and end-user engagement

Open access to publications

Definition of an open access publication

- Free access for readers
- Creative Commons (CC BY) licenses determine allowed reuse
- Publication and all supplementary materials are deposited into at least one online repository

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, 2003

Open access to publications

- Mandatory open access to peer-reviewed articles and longer texts through trusted repositories

- Embargo in a repository is not allowed

- Authors or university must retain sufficient intellectual property rights to comply with open access requirements (articles: CC BY 4.0, monographs CC BY-NC or CC BY-ND)

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Visualization and measurements of shock waves in cavitating flow

Petkovšek, Martin (author), Hočevar, Marko (author), Dular, Matevž (author)

Repository of the University of Ljubljana

Abstract
Upon cavitation cloud collapse an omnidirectional shock wave is emitted. It then travels through the flow field, causing a cascade of events resulting in erosion, noise, vibration and the cavitation shedding process.
Despite that the accumulated data points evidently to the presence of the shock waves, the direct measurements hardly exist - and even then, they are very expensive and time consuming to perform.
In the present paper, the possibility of detecting shock waves inside cavitating flow is shown.
The methodology bases on using two conventional high speed cameras. With the first one cavitating flow from a distance is observed, determining the position of the wave, while the second camera with a microscopic lens enables a close-up view to determine the number and size change of air bubbles

Language:	English
Keywords:	cavitation, shock waves, high speed video, cloud collapse
Work type:	Article (dk_c)
Tipology:	1.01 - Original Scientific Article
Organization:	FS - Faculty of Mechanical Engineering
Year:	2020
Number of pages:	Str. 1-10
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Acronym:	CABUM

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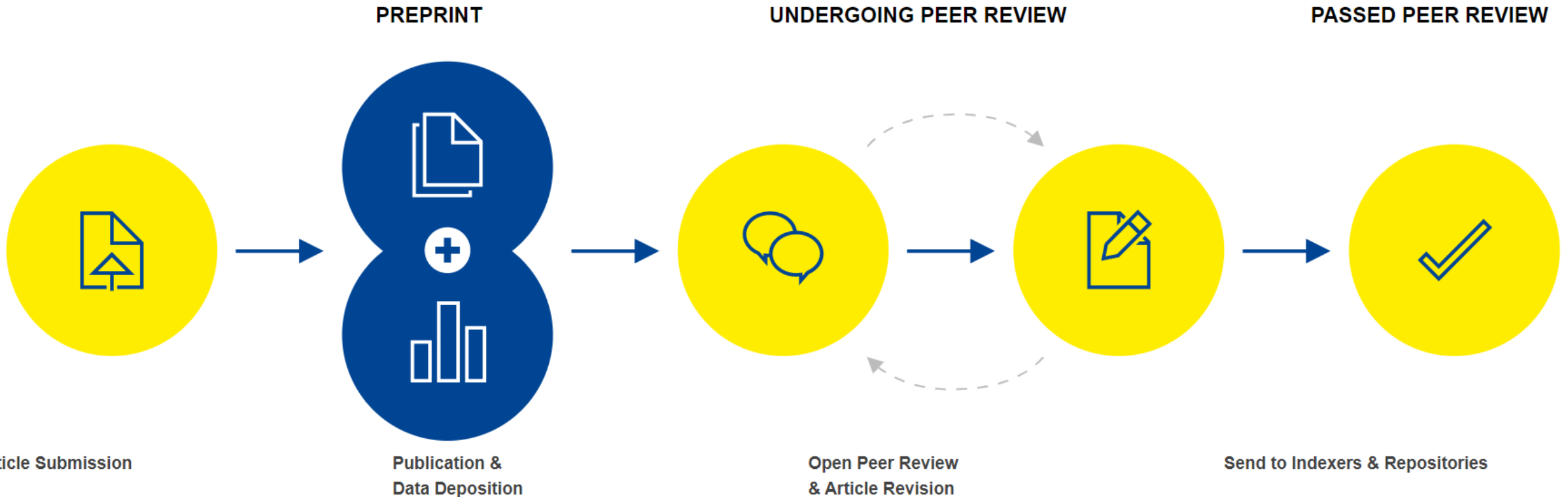Search   Deposit   Lin

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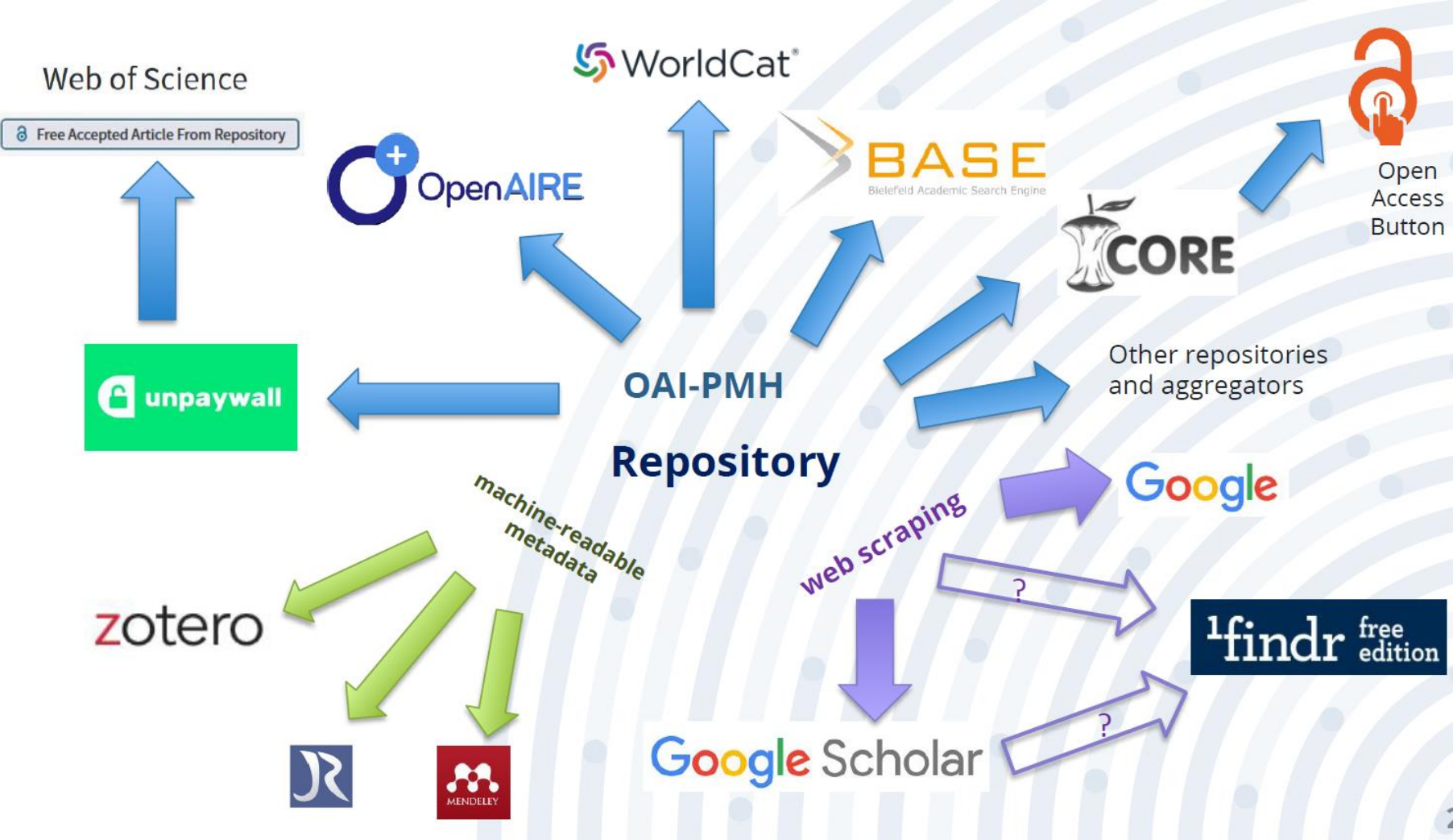
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Data Deposition

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& Article Revision

Send to Indexers & Repositories

FAIR and open research data

Research data

- Establish a Data Management Plan (DMP) and regularly update it
  - What data will be generated
  - How it will be curated and preserved
  - Which part will be open (and how)

- **FAIR** research data = **F**indable, **A**ccessible, **I**nteroperable, **R**eusable

- License the data with CC BY or CC0

- „As open as possible, as closed as necessary" via a trusted repository

- DMP tools: Argos, DMPonline

- DMP examples: DMP Use Case Project

- Find a data archive: re3data.org - Registry of Research Data Repositories, FAIRsharing.org - Databases

General rules on exemptions from open research data

In publicly funded research or non-funded research, legislation and security need to be protected:

- Intellectual property rights: Copyright and Related Rights Act, Industrial Property Act

- Personal data: General Data Protection Regulation, Personal Data Protection Act

- Security of people and country

In a contract with a company, legislation and security need to be protected, but also contract provisions:

- Protection of business interest/secret as specified in the contract

- Disclosure/open access to research data would be considered as breach of contract causing (financial) damage to a company and possible legal/financial sanctions

UL

Personal data

Informed consent

Personal data processed according to the informed consent of research subjects

Tool: DARIAH ELDAH Consent Form Wizard

Anonymization of personal data

Personal or business data rendered anonymous so it is impossible to link the data to a specific person or business subject

Tool: OpenAIRE Amnesia

Pseudoanonymization of personal data

Personal data is replaced by identifiers/pseudonyms, risk of re-identification

CESSDA advice:

Sharing personal data can often be accomplished by using a combination of obtaining informed consent, data anonymisation and regulating data access

UL

European Open Science Cloud (EOSC)

EOSC → EOSC Portal, EOSC Association

- European Strategy Forum on Research Infrastructures (ESFRI)
- EOSC: „to store, share, process, analyse, and reuse research digital objects including data, publications and software across disciplines and borders" (Horizon Europe Programme Guide)
- Institutional, national, European initiatives
- European Research Data Commons of FAIR data = European contribution to Web of FAIR Data and Related Services for Science

Citizen science

Resources on citizen science

- Citizen science toolkit
- Zooniverse (platform for citizen science)
- EU-Citizen.Science Training Resources, https://moodle.eu-citizen.science
- WeObserve Cookbook
- Scivil - Guides and manuals
- Citizen Science Guide - Section 1: Citizen Science Skilling for Library Staff, Researchers, and the Public
- European Citizen Science Association

Capacity building for open science

Many courses available: examples

- FOSTER courses

- Open Science MOOC

- Open Science: Sharing Your Research with the World

- ORION MOOC for Open Science in the Life Sciences 2.0

- Eurodoc Open Science Ambassador Training

- Passport for open science: a practical guide for PhD students

Reform of research assessment

Need to change research assessment

- San Francisco Declaration on Research Assessment (DORA), Leiden Manifesto for Research Metrics

- Assess different research results, not only publications and the latter not according to the impact factor

- Science Europe, European University Association, European Commission, coalition of organizations: joint drafting of Agreement on reforming research assessment

AGREEMENT ON REFORMING RESEARCH ASSESSMENT

20 July 2022

Copyright reform

Copyright reform in support of open science: analyses recently published

- [Study on EU copyright and related rights and access to and reuse of scientific publications, including open access - Exceptions and limitations, rights retention strategies and the secondary publication right](#)

- [Study on EU copyright and related rights and access to and reuse of data](#)

- [Study on the Open Data Directive, Data Governance and Data Act and their possible impact on research](#)

- [Study on the Digital Services Act and Digital Markets Act and their possible impact on research](#)

Thank you for your attention!

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