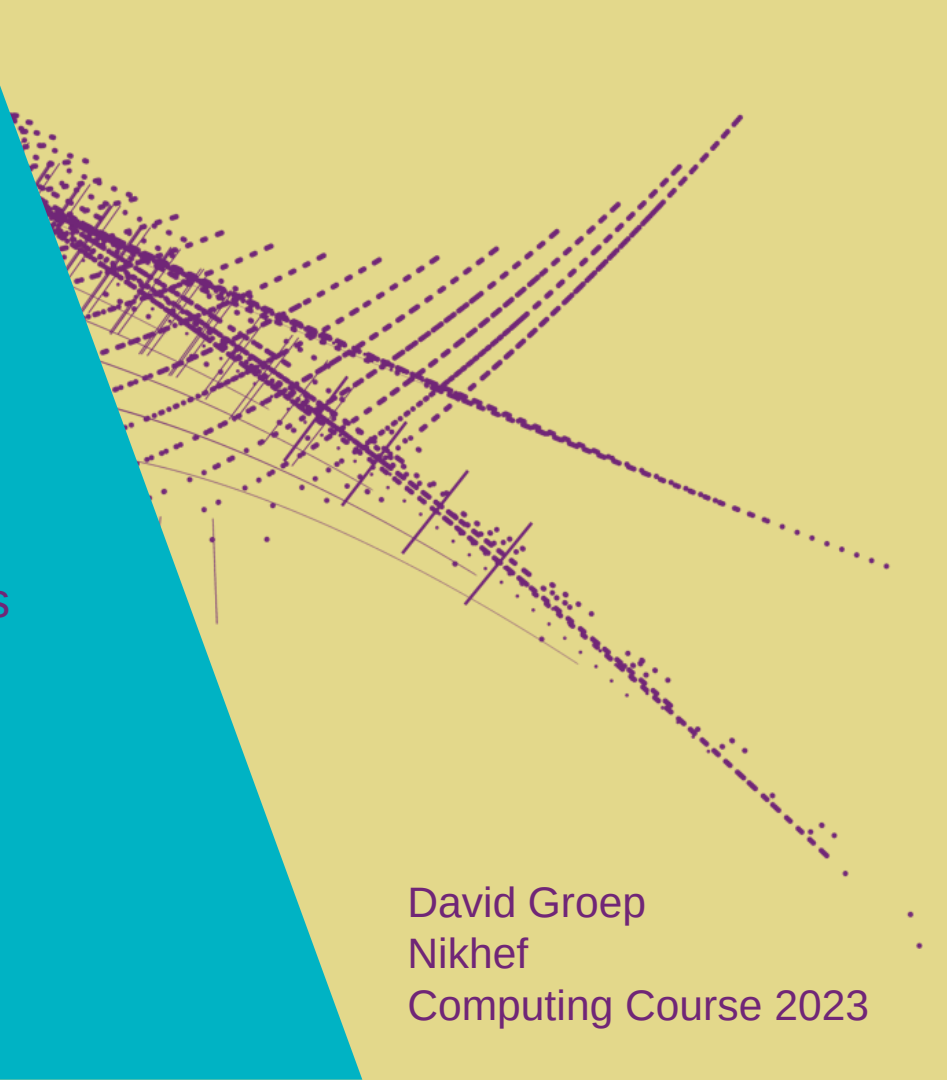
Nikhef

Maastricht University

Identifiers, repositories, licenses, and DMPs

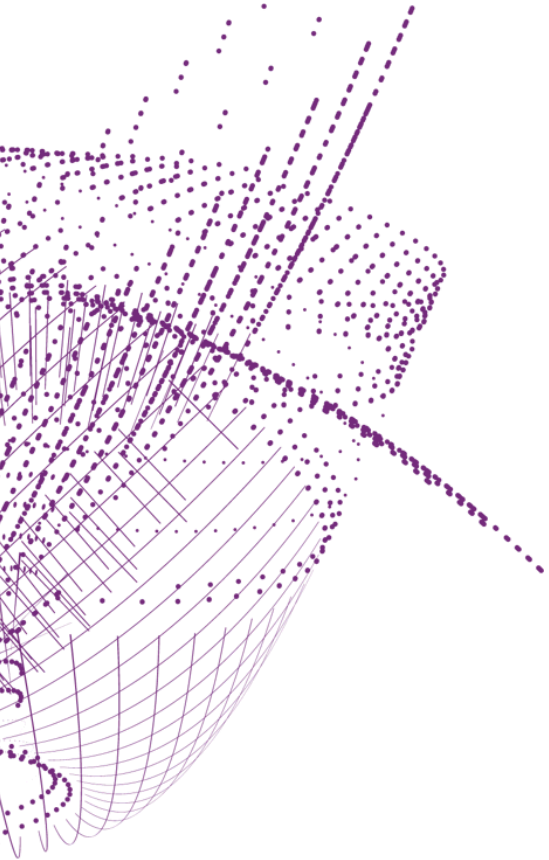
When your data becomes part of something bigger



David Groep
Nikhef
Computing Course 2023

Objectives for this ‘data and software’ session

- Know common persistent identifier schemes; such as DOI, hndl.net and ORCID
- Possess an ORCID identifier and
  know how to update basic information in their ORCID record
- Know the importance of applying licenses to data and software for re-usability
- Know the basic licenses for data and software, and
  know where to find guidance on license application,
  and the main differences between licenses
- Know the basic outline of a data management plan
- Know how to fill in a mock data management plan using the on-line tools



Persistent identifiers
for publications, data … and for researchers

I’m not a number!

Getting a unique identifier is hard … which Anna Wilson?

First Name	Last Name	Other Names	Affiliations
Anna	Wilson		University of Alberta, Weir Memorial Law Library University of Alberta
Anna	Wilson		Phi Beta Kappa Society, Washington University in St Louis, Washington University in St Louis School of Medicine
Anna	Wilson		Charles Sturt University, Premier Specialists, St George Hospital, UNSW Sydney, University of Wollongong
Anna	Wilson		Duke University, University of California San Diego Scripps Institution of Oceanography
Anna	Wilson		Lund University, Lund University Samhällsvetenskapliga fakulteten, University of Lausanne, Universität St. Gallen
Anna	Wilson		Dartmouth College, U.S. Geological Survey, University of New Hampshire
Anna	Wilson		Hennepin Healthcare Research Institute, University of Minnesota
Anna	Wilson	A N Wilson, A Wilson, Anna N Wilson	Abertay University, Australian National University, University of Bristol, University of Canberra, University of Glasgow, University of Liverpool, University of Oxford, University of Stirling, University of York, Yale University
Anna	Wilson		Harvard University
Anna	Wilson		Auburn University
Anna	Wilson		University of Salford

Data from ORCID – search for “Anna Wilson”

Assigning a globally unique non-reassigned one helps:

ORCID ID	First Name	Last Name	Other Names	Affiliations
0000-0003-2397-7941	Anna	Wilson		University of Alberta, Weir Memorial Law Library University of Alberta
0000-0001-6285-3824	Anna	Wilson		Phi Beta Kappa Society, Washington University in St Louis, Washington University in St Louis School of Medicine
0000-0001-5596-2109	Anna	Wilson		Charles Sturt University, Premier Specialists, St George Hospital, UNSW Sydney, University of Wollongong
0000-0001-7342-1955	Anna	Wilson		Duke University, University of California San Diego Scripps Institution of Oceanography
0000-0002-4478-675X	Anna	Wilson		Lund University, Lund University Samhällsvetenskapliga fakulteten, University of Lausanne, Universität St. Gallen
0000-0002-9737-2614	Anna	Wilson		Dartmouth College, U.S. Geological Survey, University of New Hampshire
0000-0002-4543-1344	Anna	Wilson		Hennepin Healthcare Research Institute, University of Minnesota
0000-0001-6928-1689	Anna	Wilson	A N Wilson, A Wilson, Anna N Wilson	Abertay University, Australian National University, University of Bristol, University of Canberra, University of Glasgow, University of Liverpool, University of Oxford, University of Stirling, University of York, Yale University
0000-0002-5229-9716	Anna	Wilson		Harvard University
0000-0002-8575-7138	Anna	Wilson		Auburn University
0000-0002-5563-2318	Anna	Wilson		University of Salford

Data from ORCID – search for “Anna Wilson”

What should an identifier scheme do?

- **unique**
- **persistent**
- **non-reassigned**

- findable: identifier should be good enough to take you to the object

- for ‘evolving’ objects: be able to identify a *collection* (and ‘latest version’)

- come from an *authoritative source*

Not all identifiers are created equal

Technical qualities, but also ‘impact perception’

- ObjectIDs (OID)
- Universal Resource Names (URN)
- Digital Object Identifiers (DOI)
- Handles (hndl.net)

And then there are plenty of *non-persistent identifiers*, like URLs

Uniform Resource Indicators == URLs + URNs

But URLs *do* change for no good reason (or simply because “functions follows form”)

W3C Style

Cool URIs don't change

What makes a cool URI?
A cool URI is one which does not change.
What sorts of URI change?
URIs don't change: people change them.

There are no reasons at all in theory for people to change URIs

URNs (and OIDs) are unique + persistent but hard to resolve – just try find the path to

`urn:geant:nikhef.nl:idm:md:entity:spproxy:201606`

Tim Berners-Lee, https://www.w3.org/Provider/Style/URI, 1998; for the URN namespace, see RFC 4926, then http://www.dante.net/urn-geant/urn-geant.html, then see #12

DOI and Hndl.net

DOIs – a persistent link (opaque) to publications & more …

- originally come from the publishing industry (CrossRef)
- perception is still very much ‘high quality paper’ like
- libraries and evaluation reports really love DOIs
- but are a bit expensive for repositories with lots of objects

but there are now many large-scale repositories for data, whitepapers, drafts, presentations, &c that assign DOIs

- Zenodo (hosted at CERN and supported by OpenAIRE)
- 4TU.RD (hosted at TU Delft)
- and commercial services like Figshare

and now the movie industry even assigns DOIs to films and broadcasts

One well-cited dataset

https://doi.org/10.7935/K5MW2F23

but an updated version (in this case a phase correction) results in a **new** DOI

https://doi.org/10.7935/82H3-HH23

This is the data set corresponding to GW150914
data reference https://www.gw-openscience.org/eventapi/html/GWTC-1-confident/GW150914/v3 - also adhered to common data formats (here: HDF5) – see later!

DOI:10.7483/OPENDATA.ATLAS.CPVE.5FA9

MC:Zττ + Jets, for 2016 ATLAS open data release

Zττ + Jets, ATLAS Collaboration

Cite as: ATLAS Collaboration (2016). MC:Zττ + Jets, for 2016 ATLAS open data release. CERN Open Data Portal.
DOI:10.7483/OPENDATA.ATLAS.CPVE.5FA9

Dataset | Simulated | ATLAS | 8TeV | CERN-LHC

mc_147772.Ztautau.root	91.4 MB	Download

Disclaimer

The open data are released under the Creative Commons CC0 waiver. Neither ATLAS nor CERN endorse any works, scientific or otherwise, produced using these data. All releases will have a unique DOI that you are requested to cite in any applications or publications.

PUBLIC DOMAIN

http://opendata.cern.ch/record/3822, resolved from the DOI http://doi.org/10.7483/OPENDATA.ATLAS.CPVE.5FA9

DOIs can be assigned to almost any object

zenodo | fim4r | Upload | Communities

March 26, 2020

Working paper | Open Access

FIM4R Position Paper on the Desired Evolution of EOSC Authentication and Authorisation Infrastructures

FIM4R Community

The European Open Science Cloud (EOSC) will soon enter the next phase of integration and consolidation with the establishment of a common service portal listing underpinning services that enable distributed resources in the areas of computation, data, open access, and above-the-net collaboration services. The Federated Identity Management for Research (FIM4R) community at a recent full-day workshop in Vienna and at the TIIME conference later the same week (17-20 Feb 2020) discussed its views on the evolution of the EOSC Authentication and Authorisation Infrastructure (AAI) and the conclusions are documented here. These have been distributed to the whole FIM4R community, including those who were not in Vienna, with individuals given a two week comment period after which all input was incorporated. This paper is an agreed statement on behalf of the whole community.

Preview

Page: 1 of 3 | Automatic Zoom

FIM4R Position Paper

On the Desired Evolution of EOSC Authentication and Authorisation

Basic information

Digital Object Identifier

e.g. 10.1234/foo.bar

Optional. Did your publisher already assign a DOI to your upload? others to easily and unambiguously cite your upload. Please note is always possible to edit a custom DOI.

Reserve DOI

Indexed in

OpenAIRE

Publication date:
March 26, 2020

DOI:
DOI 10.5281/zenodo.3727546

Keyword(s):
EOSC FIM4R AAI

Communities:
Federated Identity Management for Research

License (for files):
Creative Commons Attribution 4.0 International

https://zenodo.org/ and for your own experimentation, use https://sandbox.zenodo.org/

Make sure you have identifiers for everything

Also for data sets, software, standards specifications, &c
– they come in handy for grant applications, like for a Veni:

4b. Key output

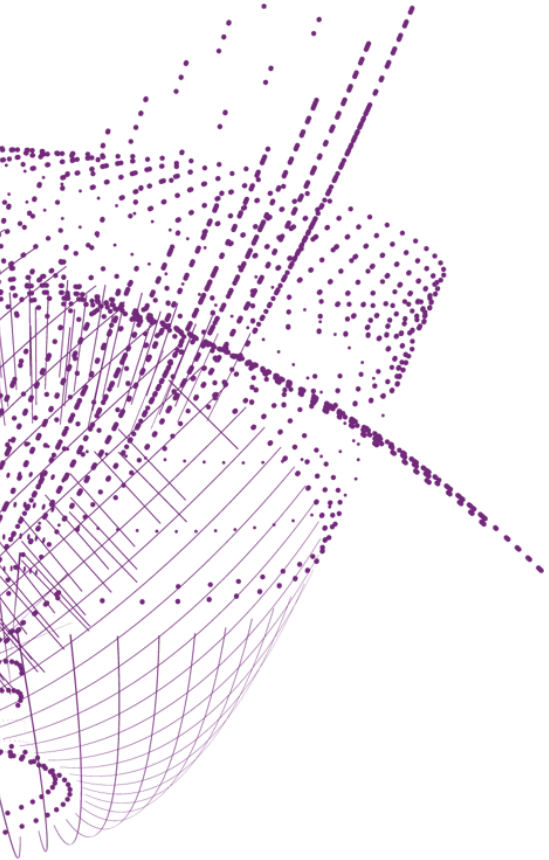
Provide the references to your key output (max. 10) and add a motivation for the selection of each of these items. Please number the items consecutively. You are allowed to use one hyperlink per item, which refers directly to the output (**e.g. a DOI**). You may not mention H-indexes, journal impact factors, or any other indicator or term that refers to the general quality or reputation of a journal, publisher, or publication platform, rather than to the individual output item. For more information, expand the Explanatory Notes

- for papers, journal will assign one

11. arXiv:nucl-ex/0703007 [pdf, ps, other] nucl-ex doi 10.1016/j.physletb.2007.08.034
16O(e,e'p) reaction at large missing energy
Authors: M. Iodice, E. Cisbani, R. De Leo, S. Frullani, F. Garibaldi, D. L. Groep, W. H. A. Hesselink, E. Jans,
J. G. Onderwater, R. Perrino, J. Ryckebusch, R. Starink, G. M. Urciuoli
Abstract: We investigate the origin of the strength at large missing energies in electron-induced proton

- arXiv links are persistent as well and link to later DOIs

From the Veni 2022 grant template, see https://www.nwo.nl/en/calls/nwo-talent-programme-veni-science-domein-2022



Identifying you …

ORCID – the Open Reseacher and Contributor ID

- helps to uniquely identify your papers
- makes sure recognition goes to the right author
- helps you build your list of publications

- can act as an academic resume
- use it to login to R&E services

- needed for grant applications

Research infrastructure (LSRI)

Consortium

Please list In the table below all consortium members. The call distinguished four different categories of consortium members: 1) main applicant; 2) co-applicant(s); 3) co-funder(s) (not compulsory); 4) cooperation partner(s) (not compulsory). Adhere to these categories in the table below. Remove categories 3 and/or 4 if not relevant. The main applicant and co-applicants (categories 1 and 2) must meet the requirements for (co-)applicants as stated in the call for proposals, Section 3.1.1, and must also be entered in ISAAC.

Title, first name, initials, surname	Affil.	Expertise	ORCID/website/DAI/other	Role(s)
Main applicant				
Prof Dr E. (Edward) Example	*TUD RUG*	*Queueing theory*	orcid.org/0000-0000-0000-0000	*WP3 leader*
Co-applicant(s)				
Dr V. (Vera) Vorschlag	*RUG*	*Peer-to-peer networks, Data science*	www.vorschlag.com	*WP2 contributor*
V. (Victor) Voorbeeld	*Philips*	*Cooling liquids*	www.phillips.com/groupvb	*Technical support*

Go to https://orcid.org/

Example from NWO Roadmap 2021 Application Form, from https://www.nwo.nl/en/calls/large-scale-research-infrastructure-lsri-national-roadmap-consortia-2021

Recognising and using ORCID with linking

- based on the ISNI format

orcid.org/**0000-0003-1026-6606**

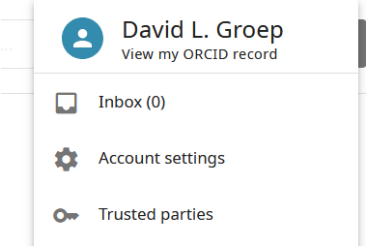
- can be linked automatically in journals and repositories

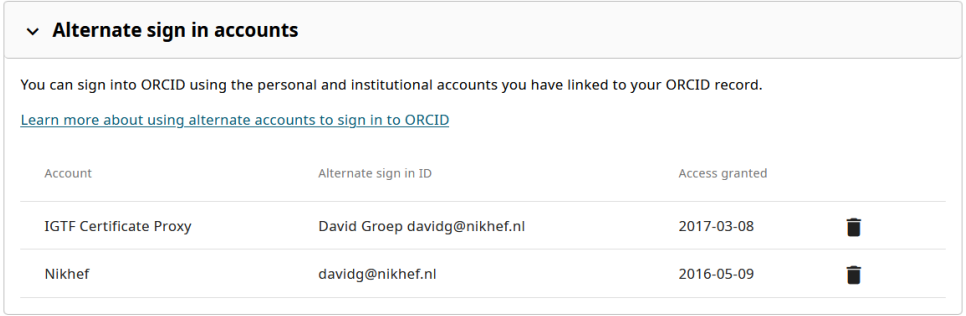
https://arxiv.org/help/orcid; https://doi.org/10.5281/zenodo.7260200

Authenticating to your ORCID

Your ORCID ID is *for life* – not only when you're at Nikhef

- you can link multiple *authentication sources* to your ORCID
- one is a username-password specific to the service
- you can link one (or more) institutional IDs *(also most universities should work)*





- you should add *multiple email addresses* to your ORCID (also a personal one) – these are *not public by default!*
- as well as multiple login methods! At some point, you may leave your home org!

Multiple ways into your ORCID is good

Access through your institution

You may sign into the ORCID Registry using institutional accounts you already have, like one from your university. If you don't already have an ORCID iD, you will be prompted to create one. **Learn more about different ways to sign in to ORCID.**

institution logo

Organization's name

CERN ×

Go back **CONTINUE**

Link your CERN account to your ORCID record

You are signed into **CERN** as **David Groep**

To finish linking this CERN account to ORCID, sign into your ORCID iD below. You will only need to complete this step once. After your account is linked, you will be able to access your ORCID record with your CERN account. Questions? **Visit our knowledge base**

Email or 16-digit ORCID iD

0000-0003-1026-6606

example@email.com or 0000-0001-2345-6789

Password

••••••••••••••••••••••

Sign in and link your CERN account

Cancel and go back

Forgot your password or ORCID ID?

Don't have an ORCID iD yet? **Register now**

https://orcid.org/account

Alternate sign in accounts

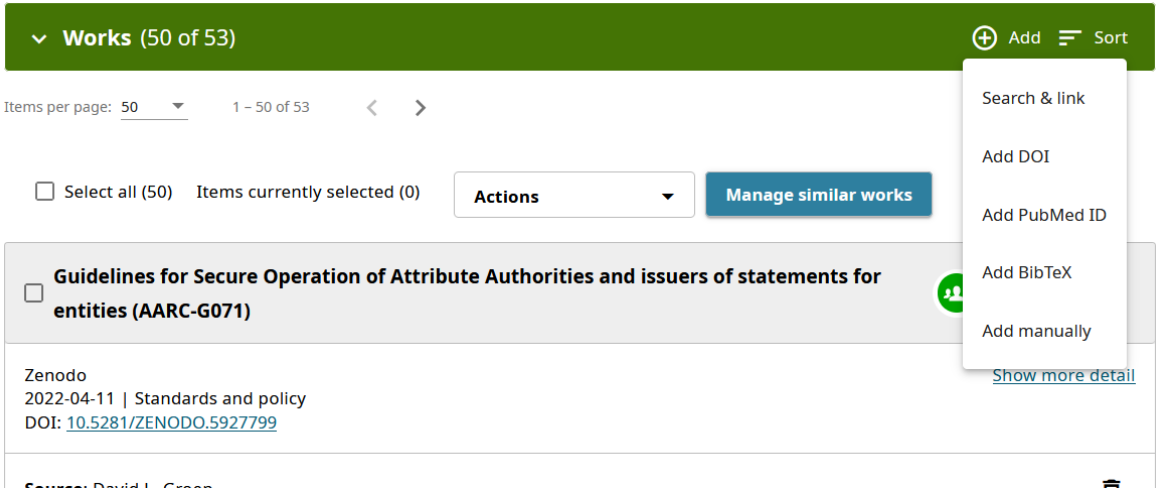
You can sign into ORCID using the personal and institutional accounts you have linked to your ORCID record.

Learn more about using alternate accounts to sign in to ORCID

Account	Alternate sign in ID	Access granted	
IGTF Certificate Proxy	David Groep davidg@nikhef.nl	2017-03-08	
CERN	groep@cern.ch	2022-11-12	
Nikhef	davidg@nikhef.nl	2016-05-09	
Maastricht University	P70081609@unimaas.nl	2023-03-08	

Linking your publications to ORCID

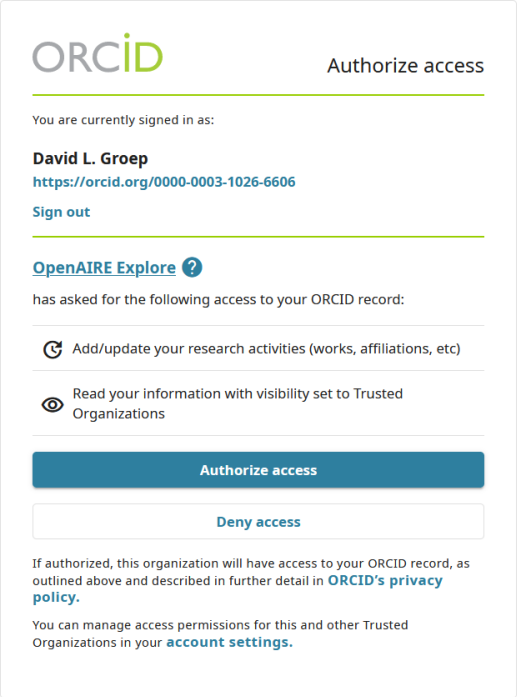
Import from Scopus and commercial publishers



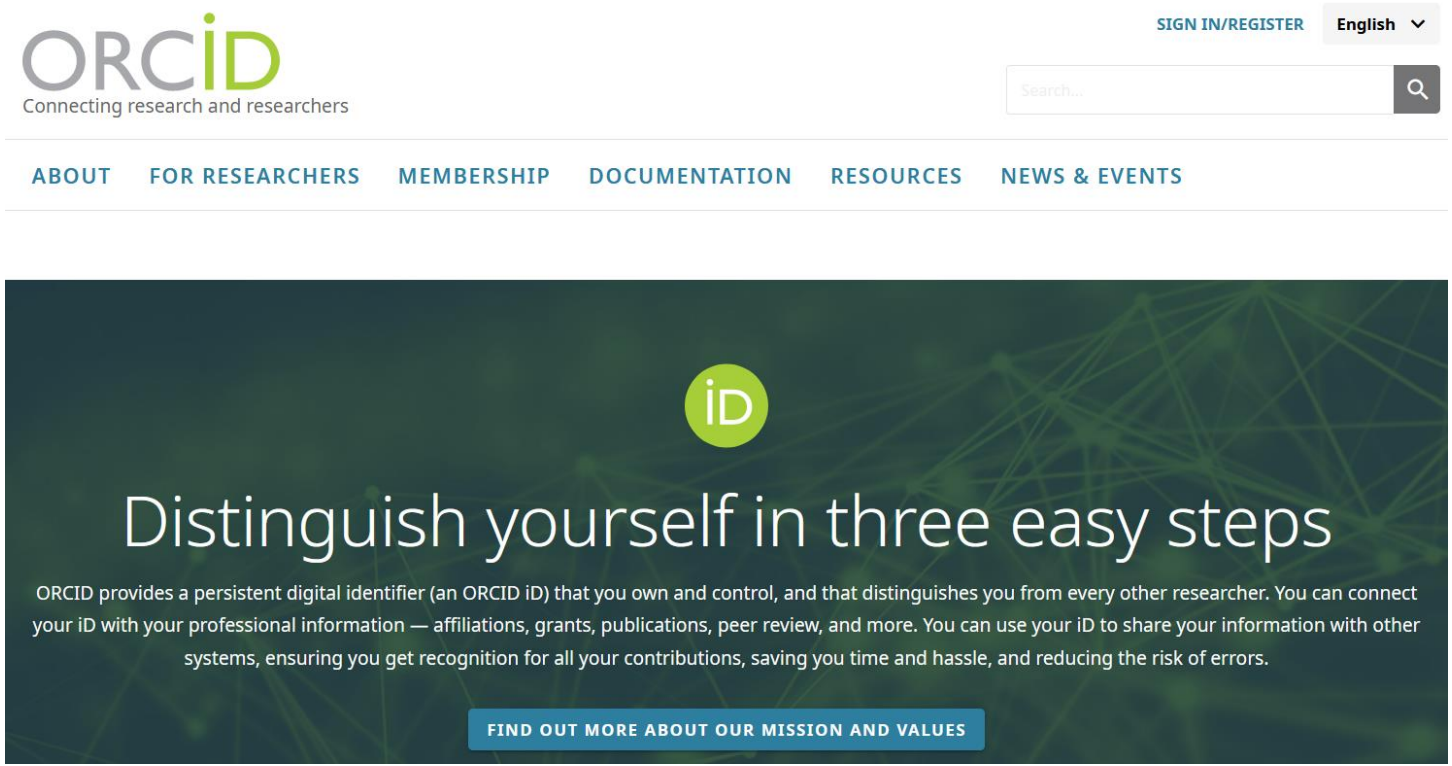
logging in to Zenodo with your ORCID

Some agencies can *update* your record for you

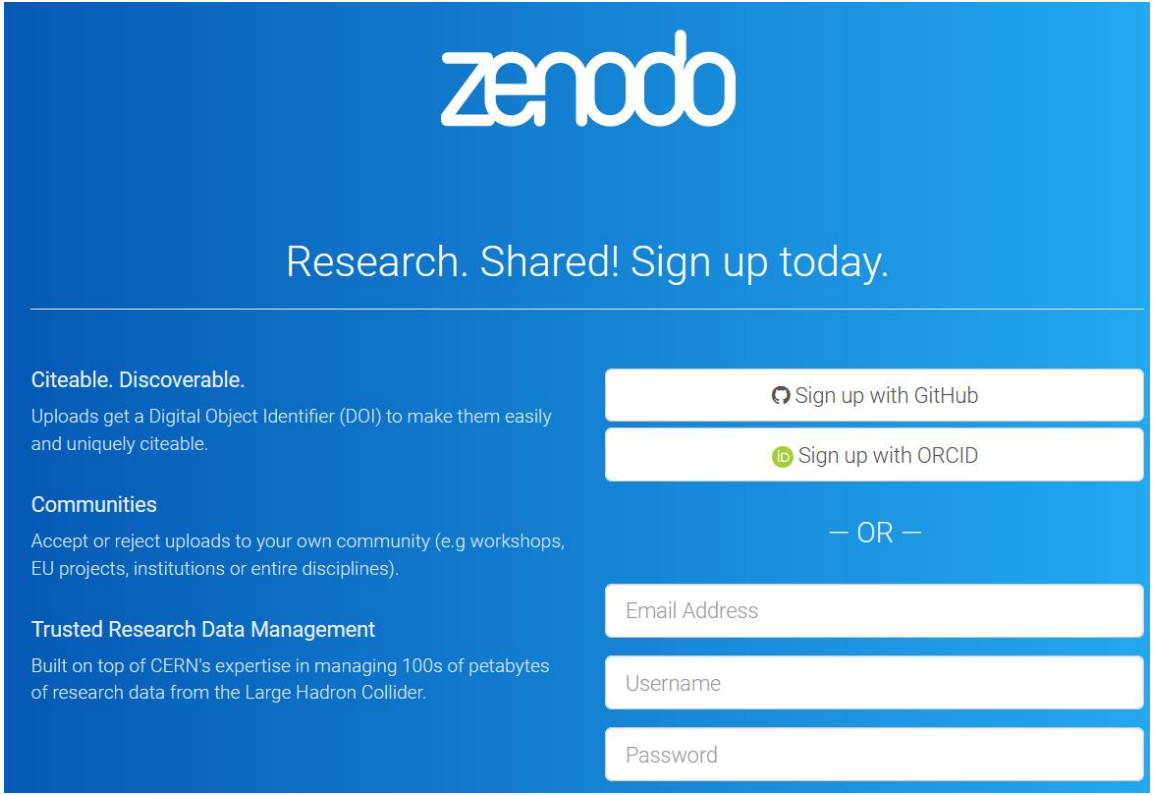
You do get a notice, like this:



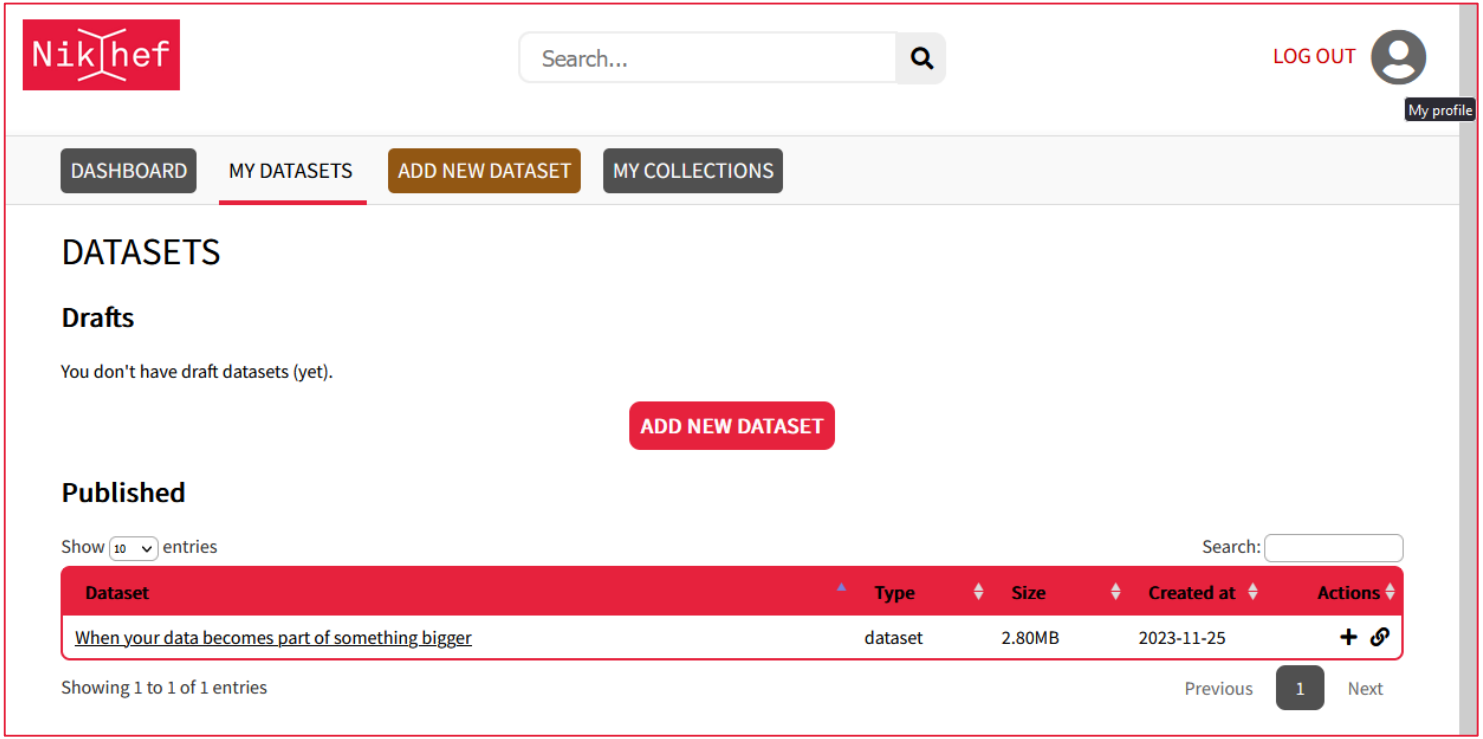
Now go over to orcid.org, and …



And sign up for Zenodo with ORCID or github (or password)



And on Djehuty – the Nikhef RDM Repository



https://archive.nikhef.nl

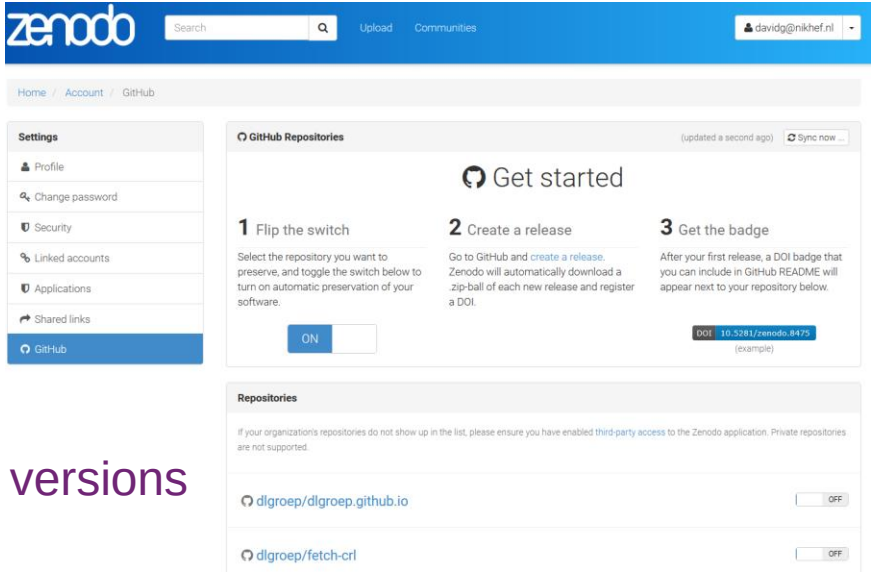
But what about PID and software?

A personal github repository is not a persistent identifier either

- it is good for FOSS and collaboration, but it is not a publication … *yet*

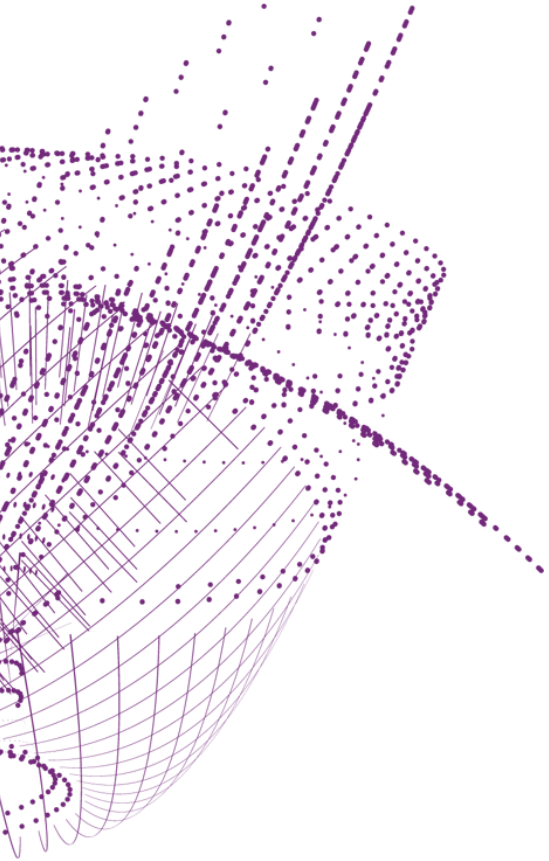
- from Zenodo, link your github account
- in Zedono select your repository
- in Github, make a *release*

this will be automatically uploaded into Zenodo – and you have persistent DOIs for all versions



specifically useful for research software and your reproduction package

https://zenodo.org/account/settings/github/ and https://docs.github.com/en/repositories/archiving-a-github-repository/referencing-and-citing-content



Licensing and open source

Enabling Software Re-use

“IANAL” + “IANYL” DISCLAIMER – I Am Not A Lawyer (and certainly not your lawyer ☺)

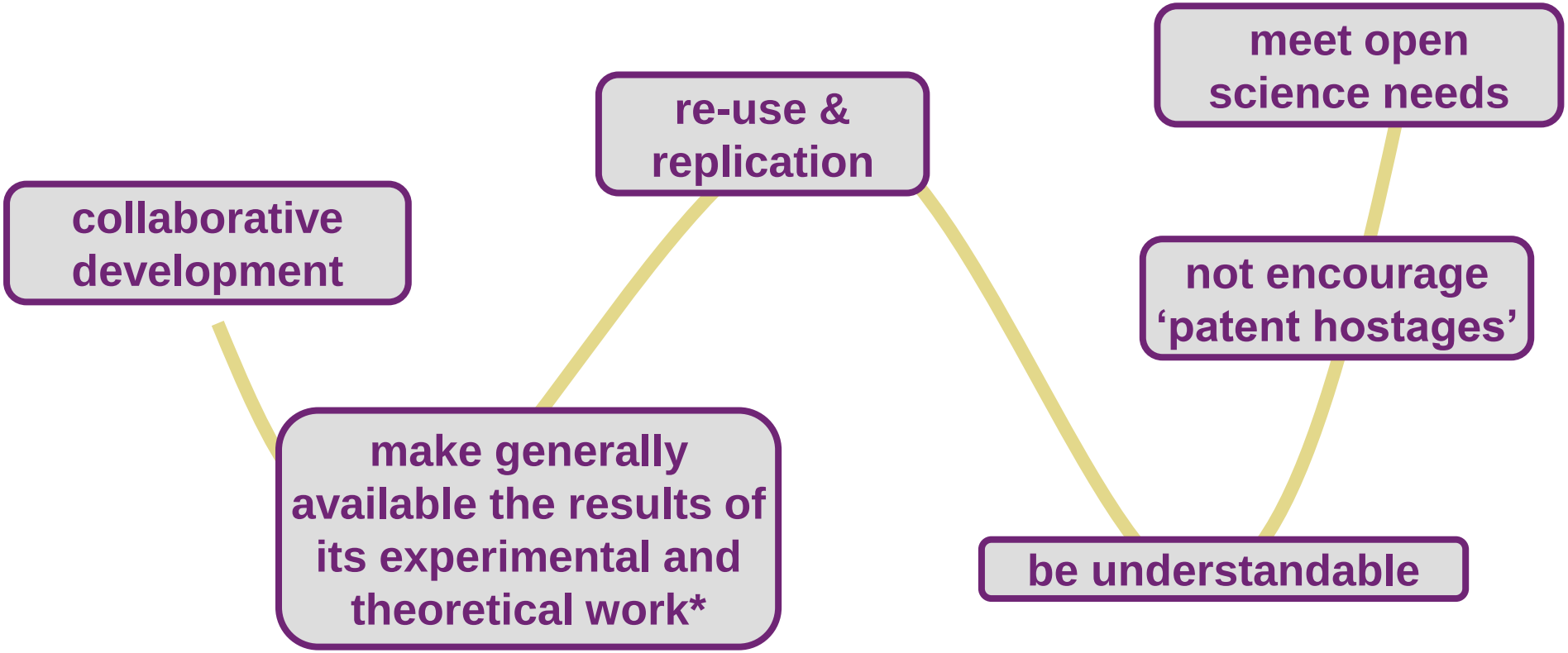
zixu/boostedWWAnalysis
boostedWWAnalysis https://twiki.cern.ch/twiki/bin/viewauth/CMS/HiggsWWTolnujBoostedWorking
Python Updated on Nov 26, 2013

FNALLPC/machine-learning-hats
FNAL LPC Machine Learning HATS 2020
machine-learning tutorial high-energy-physics cern fermilab
14 Jupyter Notebook Updated on Jul 14

scikit-hep/root_numpy
The interface between ROOT and NumPy
python numpy cython root hep cern
130 Python BSD-3-Clause license Updated on Mar 16, 2021

however: code and source files without a license means ‘all rights reserved’ ☹

What do we actually want to achieve with our software?



When your data becomes part of something bigger

E.g. Article II.1 CERN convention, see https://council.web.cern.ch/en/content/convention-establishment-european-organization-nuclear-research

A range of Open Source licenses to choose from

BSD family
compact licenses
(BSD 3-clause, BSD 2-clause, MIT)

re-use friendly | no patent protection

contributions unspecified

pre-Apache family
(GEANT4, EDG)

re-use friendly | no patent protection

contributions auto-imported

Mozilla family
(MPL, Perl Artistic)

re-use friendly | patent protection

contributions unspecified

Apache family
(Apache 2.0)

re-use friendly | patent protection

contributions auto-imported

copyleft family
(GPL)

re-use unfriendly | 3.0+patent protection

contributions auto-imported: N/A

lesser copyleft
(LGPL)

re-use unfriendly | no patent protection

contributions auto-imported: N/A

https://opensource.org/licenses

Licenses cannot be mixed at random …

For example, Apache 2.0 and GPL 2.0 are ‘incompatible’ (because Apache protects against software patents, which is a restriction beyond GPLv2), but Apache 2.0 can be linked in GPL **v3** software.

But not the other way round: GPL software is infectious / viral in nature

> *“Apache 2 software can therefore be included in GPLv3 projects […]. However, GPLv3 software cannot be included in Apache projects. The licenses are incompatible in one direction only, and it is a result of […] the GPLv3 authors' interpretation of copyright law.”*

https://www.apache.org/licenses/GPL-compatibility.html

Many LHC experiments have standard license & IP clause

although some LHC experiments are completely silent on this
(*and the CERN Convention, in II.1, does not help in case of IP from contributors)*

as this single copyright administering entity for the benefit of the LHCb collaboration. This arrangement assists LHCb in achieving the widest possible dissemination and use of its software [3]. The copyright statement that is applied to all LHCb centrally distributed application software is therefore:

"(C) Copyright CERN for the benefit of the LHCb collaboration"

https://twiki.cern.ch/twiki/pub/LHCb/LHCbNationalComputingBoard/20210215_LHCbSoftwareCopyrightAndLicense.pdf

But LHCb early on got infected with GPL code …

“The LHCb software depends on packages licensed under the “GNU General Public License (GPL)”. The terms of GPL require that derivative works be licensed under the same license that governs the original software when distributed.
Accordingly, the LHCb software stack also needs to be licensed under the

“GNU General Public License v3”

[…] the LHCb collaboration – acting through CERN as the copyright holder – can re-license or distribute the software under a dual license scheme, always taking into account dependencies and license compatibility

Yet ATLAS is all Apache 2.0, so …

So one common piece of software (Gaudi), which has
no dependencies on GPL or other LHCb core,
is Apache 2.0 licensed

And some independent code, like *Allen*, is also Apache 2.0,
with those bits of general code from LHCb used therein
being *dual licensed*.

https://twiki.cern.ch/twiki/pub/LHCb/LHCbNationalComputingBoard/20210215_LHCbSoftwareCopyrightAndLicense.pdf

Listing contributors

‘a successful community has many contributors!’

‘… but listing them all will then be a challenge!’

- co-shipped ‘contributors’ file, or a web page listing contributors
- “members of the XXX collaboration”
  + a web page is commonly used
- some projects list main contributors
  and have just given up

Geant4 Software License

Version 1.0, 28 June 2006

Copyright (c) Copyright Holders of the Geant4 Collaboration, 1994-2006.
See http://cern.ch/geant4/license for details on the copyright holders. All right

- probably worst thing to do is
  to also accept changes
  in the copyright license statement itself
  (the “SymPy” case)

‘right to be identified as an author’ is a ‘moral’ right you cannot get rid of, but can be (partially) waived, e.g. as part of employment …

Source: from the GEANT4 web pages at https://geant4.web.cern.ch/license/LICENSE.html

… and the long list of contributors

GEANT4
A SIMULATION TOOLKIT

The Geant4 Software License

Established 30 June 2006 for Geant4 release 8.1, subsequent patches and releases.

Previous releases are covered by the disclaimer included in the release.

Copyright Holders of the Geant4 Collaboration

Last revision: 30 June 2006

The collaboration has established the following list of institutions and individuals who hold copyright of parts o

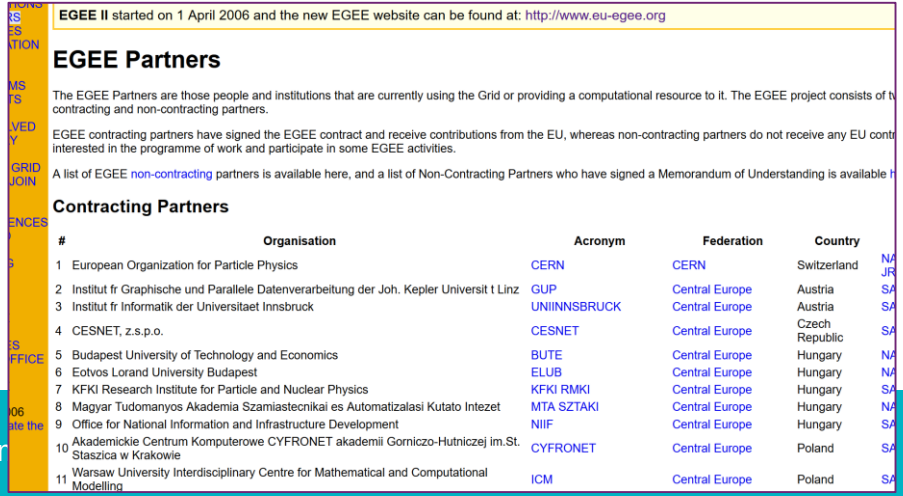
Institutions

Bath University, Bath, UK
Budker Institute Nuclear Physics, Novosibirsk, Russia
Budapest Technical University, Budapest, Hungary
California Institute of Technology, Pasadena, USA
CERN, European Organization for Nuclear Research, Geneva, Switzerland
CIEMAT, Madrid, Spain
CNRS-IN2P3, Institut National de Physique Nucleaire, France
ESA, European Space Agency
ETH, Zurich, Switzerland
Fermi National Accelerator Laboratory, Batavia, USA
Helsinki Institute of Physics, Helsinki, Finland
IHEP, Protvino, Russia
Imperial College, London, UK
Institut fur experimentelle Kernphysic, Karlsruhe University, Karlsruhe, Germany
Instituto de Fisica de Cantabria, Santander, Spain
INFN, Istituto Nazionale di Fisica Nucleare, Italy
IST National Institute for Cancer Research, Italy
Jefferson Laboratory, USA
JINR, Dubna, Russia
J. W. Goethe-Universitat, Frankfurt am Main, Germany
Karolinska Institutet, Stockholm, Sweden
KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary
Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Lisbon, Portugal
Lebedev Institute, Moscow, Russia
Manchester University, Manchester, UK
MIT, Massachussets Institute of Technology, Cambridge, USA
Moscow Engineering Physics Institute (State University), Moscow, Russia
Northeastern University, Boston, USA
Pittsburgh University, Pittsburgh, USA
Rutherford Appleton Laboratory, UK
Southampton University, Southampton, UK
Stanford University (for SLAC, SLAC National Accelerator Laboratory), Stanford, USA
Tampere University, Tampere, Finland
TRIUMF, Vancouver, Canada
University of British Columbia, Vancouver, Canada
University of California, Santa-Cruz, USA
University of Cordoba, Cordoba, Spain
University of Maryland, USA
Centre For Medical Radiation Physics (CWRP), University of Wollongong, Australia

Individuals

Akinori Kimura
Eri Suzuki
Glenn Horton-Smith
Harri Fesefeldt
Hisaya Kurashige
Hajime Yoshida
Koloyo Hoshina
Katsuya Amako
Koichi Murakami
Makoto Takahata
Makoto Asai
Masayasu Nagamatu
Marcus H. Mendenhall
Kaz Minamimoto
Robert A. Weller
Shunji Sei
Satoshi Tanaka
Yasuhide Sakaida
Toshiaki Kodama
Takayuk Yamada
Tsukasa Aso
Takashi Sasaki
Youhei Morita

either you get lists like on the left
(and then GEANT4 is a ‘small’ project)
or you become creative, like
use github’s contributor log (e.g. for SimpleSAMLphp)
or link to your project or collaboration page



EGEE II started on 1 April 2006 and the new EGEE website can be found at: http://www.eu-egee.org

EGEE Partners

The EGEE Partners are those people and institutions that are currently using the Grid or providing a computational resource to it. The EGEE project consists of tw contracting and non-contracting partners.

EGEE contracting partners have signed the EGEE contract and receive contributions from the EU, whereas non-contracting partners do not receive any EU contr interested in the programme of work and participate in some EGEE activities.

A list of EGEE non-contracting partners is available here, and a list of Non-Contracting Partners who have signed a Memorandum of Understanding is available h

Contracting Partners

#	Organisation	Acronym	Federation	Country	
1	European Organization for Particle Physics	CERN	CERN	Switzerland	NA JR
2	Institut fr Graphische und Parallele Datenverarbeitung der Joh. Kepler Universit t Linz	GUP	Central Europe	Austria	SA
3	Institut fr Informatik der Universitaet Innsbruck	UNIINNSBRUCK	Central Europe	Austria	SA
4	CESNET, z.s.p.o.	CESNET	Central Europe	Czech Republic	SA
5	Budapest University of Technology and Economics	BUTE	Central Europe	Hungary	NA
6	Eotvos Lorand University Budapest	ELUB	Central Europe	Hungary	NA
7	KFKI Research Institute for Particle and Nuclear Physics	KFKI RMKI	Central Europe	Hungary	SA
8	Magyar Tudomanyos Akademia Szamiastecnikai es Automatizalasi Kutato Intezet	MTA SZTAKI	Central Europe	Hungary	NA
9	Office for National Information and Infrastructure Development	NIIF	Central Europe	Hungary	SA
10	Akademickie Centrum Komputerowe CYFRONET akademii Gorniczo-Hutniczej im.St. Staszica w Krakowie	CYFRONET	Central Europe	Poland	SA
11	Warsaw University Interdisciplinary Centre for Mathematical and Computational Modelling	ICM	Central Europe	Poland	SA

Sources:
from the GEANT4 web pages at
https://geant4.web.cern.ch/license
and
http://eu-egee.org/partners

The most simple open source license: 3-clause BSD

- listing all contributors in the copyright line
- all rights assigned to the organisations (not individual employee)
- but:
  no patent protections

29 lines (23 sloc) | 1.51 KB

```
BSD 3-Clause License

Copyright (c) 2009-2017, AARNet, Belnet, HEAnet, SURFnet, UNINETT
All rights reserved.

Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this
  list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice,
```

e.g. https://github.com/filesender/filesender/

Have your pick …

Reinder's NWO-I LDCC License Tool:
https://www.nikhef.nl/pdp/rdm/license-tool

Nikhef RDM and Licensing guidelines:
https://www.nikhef.nl/pdp/rdm/policies

Popular Licenses

The following OSI-approved licenses are popular, widely used, or have strong communities:

- Apache License 2.0
- BSD 3-Clause "New" or "Revised" license
- BSD 2-Clause "Simplified" or "FreeBSD" license
- GNU General Public License (GPL)
- GNU Library or "Lesser" General Public License (LGPL)
- MIT license
- Mozilla Public License 2.0
- Common Development and Distribution License
- Eclipse Public License version 2.0

open source initiative
Approved License®

from: https://opensource.org/licenses

A last word about patents …

… usually for mutual litigation, but have been used against open source (although rejected)

Some licenses try to address that by voiding themselves if the licensee institutes patent litigation involving (parts of) the work against anyone else:

- Apache 2.0, GPL 3.0, Perl Artistic

(11) Application No. **AU 2001100012 A4**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Circular transportation facilitation device

(21) Application No: **2001100012** (22) Date of Filing: **2001.05.24**

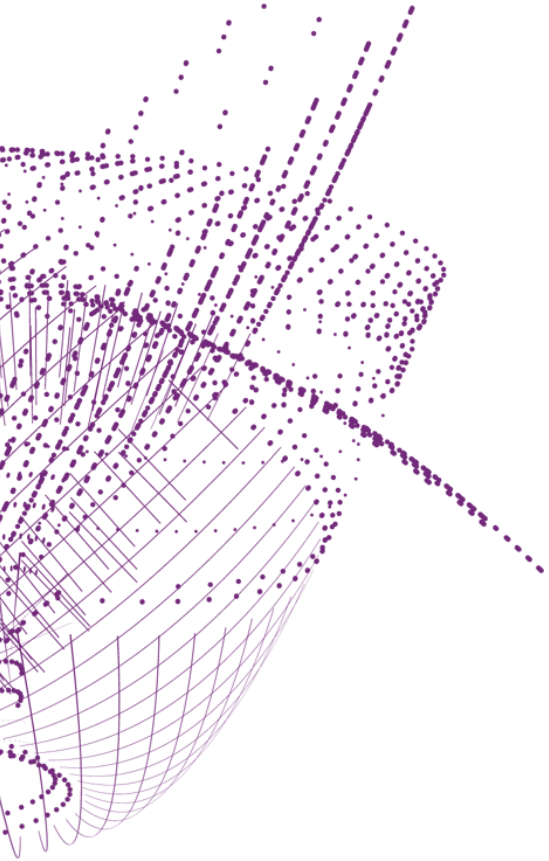
(43) Publication Date: **2001.08.02**

(71) Applicant(s)
John Keogh

(72) Inventor(s)
Keogh, John Michael

(74) Agent/Attorney
Sandercock Cowie 69 Robinson Street Dandenong Victoria AU

Australian (light-weight) Innovation Patent #2001100012, from 2001, since voided after international upheaval ☺
http://pericles.ipaustralia.gov.au/ols/auspat/applicationDetails.do
plus the 2001 Ignobel prize, of course!



Data Management Plans

You have data, you have software, you have a PID: charge!

A data management plan is there to help you*

- where did I put that data file?
- where was the source data for this plot from?
- is the place where I write the results a safe one?
- do I understand what the columns in this file mean? Also next year?
- where did *my predecessor* put that data?
- What the $*&^$$%^& does the data in this directory mean?

The Data Management Plan “DMP” helps you **structure your data**, consider **proper formats**, ways to **annotate your data** (so you know what it means), … and how to make your **results outlive your laptop**.

* and your successor, your advisors, and colleagues!

Data Management Plan structure – just 6 questions

1. What data will be collected or produced, and what existing data will be re-used? (3 / 3) +
2. What metadata and documentation will accompany the data? (2 / 2) +
3. How will data and metadata be stored and backed up during the research? (2 / 2) +
4. How will you handle issues regarding the processing of personal information and intellectual property rights and ownership? (2 / 2) +
5. How and when will data be shared and preserved for the long term? (6 / 6) +
6. Data management costs (1 / 1) +

NWO DMP format at https://dmponline.dcc.ac.uk/

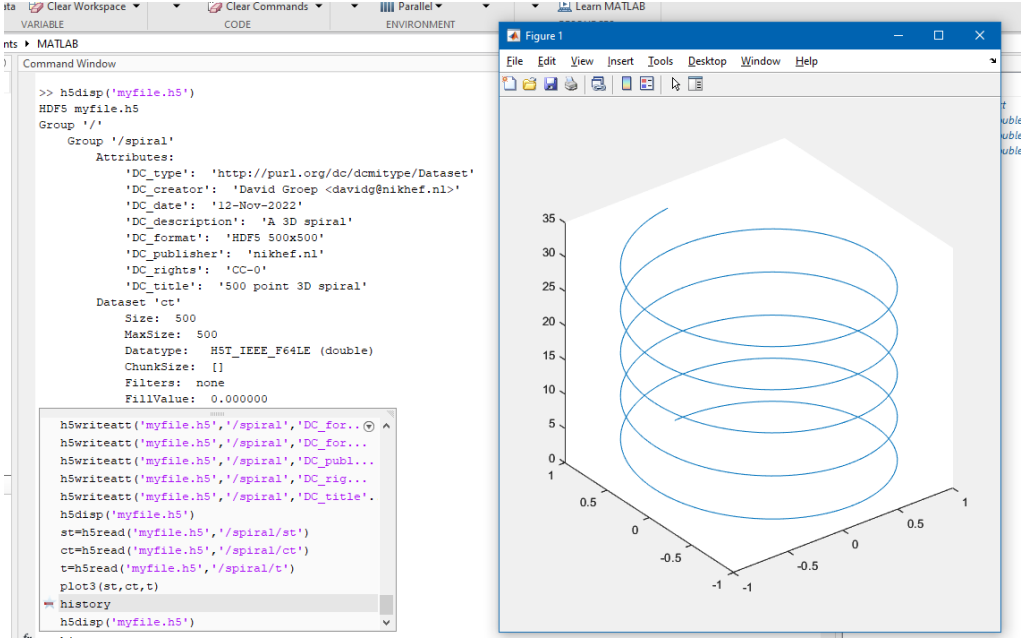
Data Management Plan elements

- What data will be collected or produced, and what existing data will be re-used?
  - Will you re-use existing data for this research?
  - If new data will be produced: describe the data you expect your research will generate and the format and volumes to be collected or produced.
  - How much data storage will your project require in total?

Useful data formats

Are commonly used, and

- should be self-describing
- allow metadata embedding
- be use re-use friendly, with a long (decades-long) comprehensibility
- OS, architecture & tool agnostic



Good examples

- root files
- CSV (HEPData compliant)
- HDF5 (and thus NetCDF)
- JSON – **with** a vocabulary

but for specific purposes, other formats are sometimes better

Organising data and meta-data

- **What metadata and documentation will accompany the data?**
  - Indicate what documentation will accompany the data
  - Indicate which metadata will be provided to help others identify and discover the data.

Consider

- using a ‘cookie cutter’ to organize sources, references, results, https://cookiecutter.readthedocs.io/ (see Roel’s session as well)
- and your repository/git convention, so add `README`, `LICENSE`, `NOTICE`, `CHANGES`, `CONTRIBUTING`
- *and then on to meta-data …*

As a cookie cutter example, see e.g. https://github.com/drivendata/cookiecutter-data-science

Dublin Core and more

Already encountered the basic “Dublin Core” meta-data elements this morning

But you may need more **meta-data for interoperability**

- your experiment framework may provide that (alongside DC where useful)
- most of HEP is bespoke, given its long tradition and life span, but has meta-data
  … *we just never bothered to register, given the coherency of the discipline*
- **do ask** which other standards are relevant
  for example for GW, we also look at the IVOA standards
  https://www.ivoa.net/documents/RM/20070302/index.html
- and review the RDA meta-data standards catalogue https://rdamsc.bath.ac.uk/

most file formats support *embedding*: e.g. for Root objects, there’s TTree::fUserInfo

https://root-forum.cern.ch/t/meta-data-in-root-files/16490/2 - see also the Research Data Alliance outputs at https://rd-alliance.org/

When you still want to work with the data

- How will data and metadata be stored and backed up **during the research**?
  - Describe where the data and metadata will be stored and backed up during the project.
  - How will data security and protection of sensitive data be taken care of during the research?

Put your data in the right place

During your work, use *managed systems*

- **avoid using only your local laptop** for storage,
  so use SURFdrive for syncing non-reproducible plots and docs
- external disks/USB thumbdrives are for **transfer only**
- publishable results, code, scripts, meta-data?
  these should be in /project/<groupname>
- bulk data, events, large data that can be generated
  should be in /data (small volumes) or /dcache
- data suitable for re-use: in your experiment DDM system, in Zenodo, arXiv, or SURFDataRepository

See https://www.nikhef.nl/pdp/doc/storage-classes

Summary: Data storage at Nikhef comes with
and care. For example, your home directory sh
up. Read about which type of files should go w

Table of Contents

Some data needs more care than others

- **How will you handle issues regarding the processing of personal information and intellectual property rights and ownership?**
  - Will you process and/or store personal data during your project?
  - How will ownership of the data and intellectual property rights to the data be managed?

Consider

- Do you collaborate with industry? What does the consortium agreement say?
- Do you use information ‘under NDA’ as an input? Review how it affects the results!

When you are done with your data ... but the world isn't

- **How and when will data be shared and preserved for the long term?**
  - How will data be selected for long-term preservation?
  - Are there any (legal, IP, privacy related, security related) reasons to restrict access to the data once made publicly available, to limit which data will be made publicly available, or to not make part of the data publicly available?
  - What data will be made available for re-use?
  - When will the data be available for re-use, and for how long will the data be available?
  - In which repository will data be archived and made available for re-use, under which license?
  - Your strategy for publishing the analysis software that will be generated in this project?

Long-term preservation – once you (think) you're done

'Curation may be the art of throwing away' – but what to keep?

keep things **'relevant for re-use'**

- obviously: all data that is used directly in publications
- data that can be needed to *reproduce the analysis* (also for research integrity)
- for a few specific things: there can be *regulatory requirements* to keep it

See e.g. https://www.dcc.ac.uk/guidance/how-guides/appraise-select-data

Not all data is, or should, be public

Quite obvious for personal data (“GDPR”) – but we don’t have much of that

But

- It may be ‘**dual-use**’, and then subject to grant conditions or regulatory constraints
- It could disclose data we got originally as ‘commercial in confidence’ (under **NDA**)
- Even if not dual-use, also non-published results it may still be sensitive
  think of potential abuse-cases!
- any irking about what your data or project could cause? Talk about it!
  there is the ‘loket Kennisveiligheid’, and we have access to more sources
- Is your result patentable? Then you should file a patent *before* publishing

For knowledge safety, ethical, and espionage concerns, contact me, ronalds@nikhef.nl, or avr@nikhef.nl

Is Open Data always open *right now* ?

Data in *publications*, data points in plots, should be open alongside it,

For the rest

- data can be **embargoed** (be in a '**proprietary period**')
  for most LHC experiments 5 years after run ends, for LIGO 18 months, …
- for bulk data does not make sense: e.g. raw LHC data ('level 4') are not released
- think of 'non-intuitive' cases, e.g. some raw data for machine learning research, or how other domains can re-use data
- 'open by default, closed only when necessary' – and include the needed software

and in the data management plan, describe *what* data is made available *when*
''where' we already discussed: your collaboration open data system, or Zenodo, or …

See e.g. http://opendata.cern.ch/docs/cern-open-data-policy-for-lhc-experiments , https://www.gw-openscience.org/, and https://dcc.ligo.org/LIGO-M1000066/public

The million-euro question … literally ☺

- **Data management costs**

  - What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable

Keep in mind

- *Open Access publication costs money, and*
- *then you store a lot of data, the repository must charge for it as well*

Storing data is quite costly:
if data is actually used, it is ~80 Eur/TB/year, and even for 'archival' data it is ~15 Eur/TB/year!
The Repository - meta-data & anything beyond transfer accessibility – needs both storage ***but also effort***

Filling your Data Management Plan

- a DMP is there to make your results ‘FAIR’, so be kind to your peers and do things reasonable for our work. So for GW, use formats that are discipline relevant (like IVOA meta-data), for LHC things use Root files.

  For other kinds of arrays (like geo data, detector measurements), use a structured self-describing format like HFD5 or a well-documented CSV.

- don’t re-invent the wheel, there are Nikhef-specific examples!
- anyway, there is a Nikhef Data Management Policy … www.nikhef.nl/pdp/rdm/

- use an on-line DMP tool to guide you through the process

Try it now as a mock DMP on https://dmponline.dcc.ac.uk/

https://www.nikhef.nl/pdp/rdm/

Examples for pure-LHC centred projects

Nikhef PDP & Data Processing Facility | Nav | News | Programme | Services | Contact | search...

Services and software

- About the NDPF
- News and events
- Services and Resources
- Computing course
- Service documentation
- Research Data Management
  - Nikhef DMP Policies
  - DMP templates
  - License Selection Tool
  - LDCC Digital Competence Centre
- Other services
- Systems
- Software and Tools

Data management templates

Summary: These documents provide good background and some copy-paste text that can be used to generate or fill the required NWO Data Management Plan (DMP) documents for any project related to the LHC experiments. The text you can copy from here, actually making a properly-formatted DMP is most easily done in [DMP Online] (https://dmp.nwo.nl/).

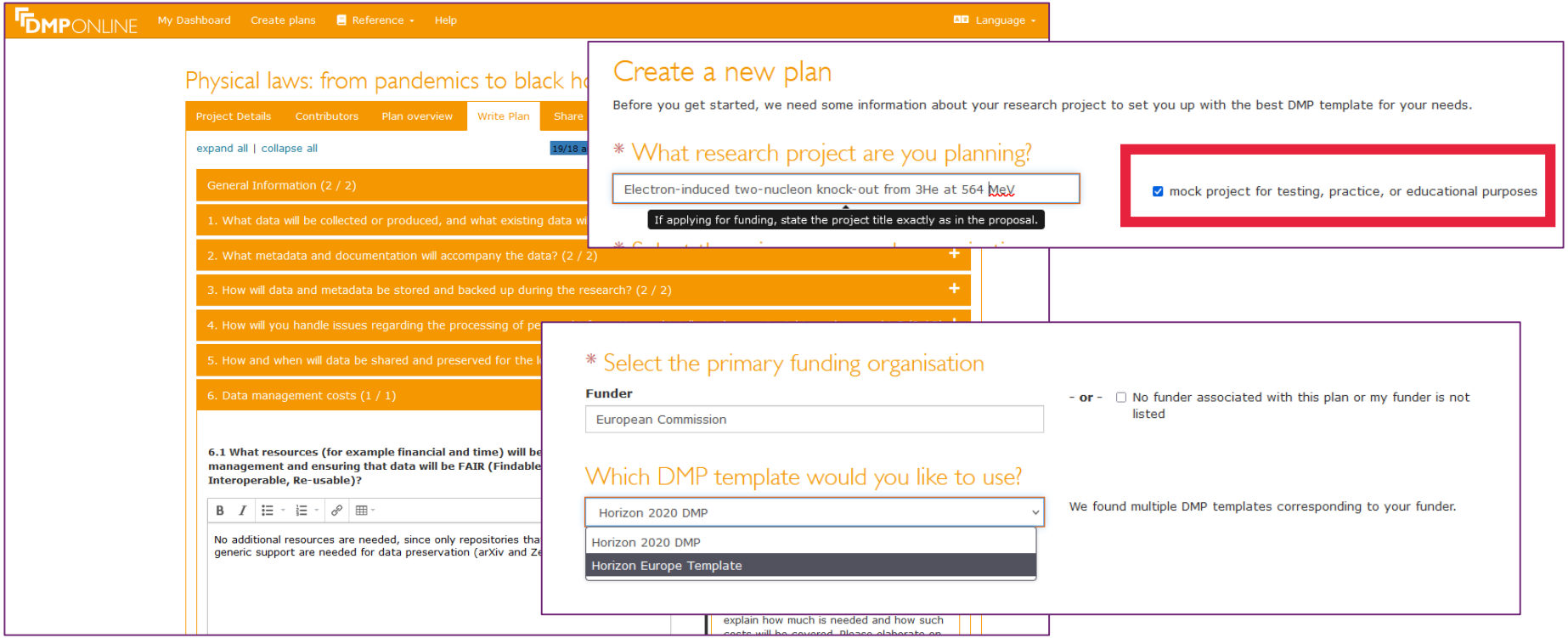
Note: Really - use the DMPOnline tool and save everyone a lot of work.

Forms for use in NWO submission

Formulier Datamanagementplan ENG - ATLAS-v03-plan.docx	Nikhef template LHC ATLAS DMP form
Formulier Datamanagementplan ENG - ATLAS-v03-plan.pdf	Nikhef template LHC ATLAS DMP form
Formulier Datamanagementplan ENG - Alice-v01-	Nikhef template LHC Alice DMP form

https://www.nikhef.nl/pdp/doc/dmp-templates

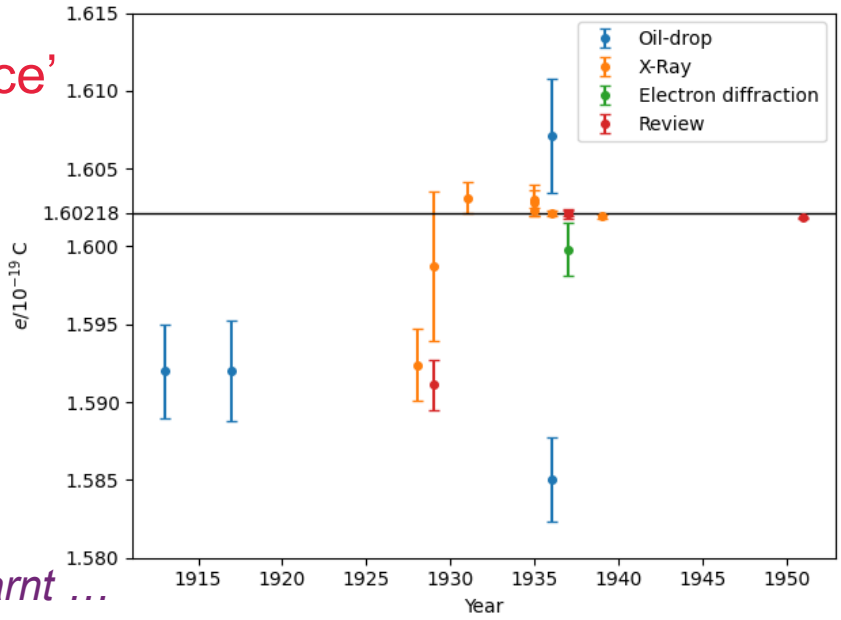
DMP Online Tool – a global tool



Also used by NWO: https://dmp.nwo.nl/ - it is the same instance

Data reproducibility

since data management is ‘just good science’



besides obvious issues you already know:

- results altered or omitted to make it ‘look good’
- use open data to identify selection bias (or just ‘interesting’ use of statistics …)

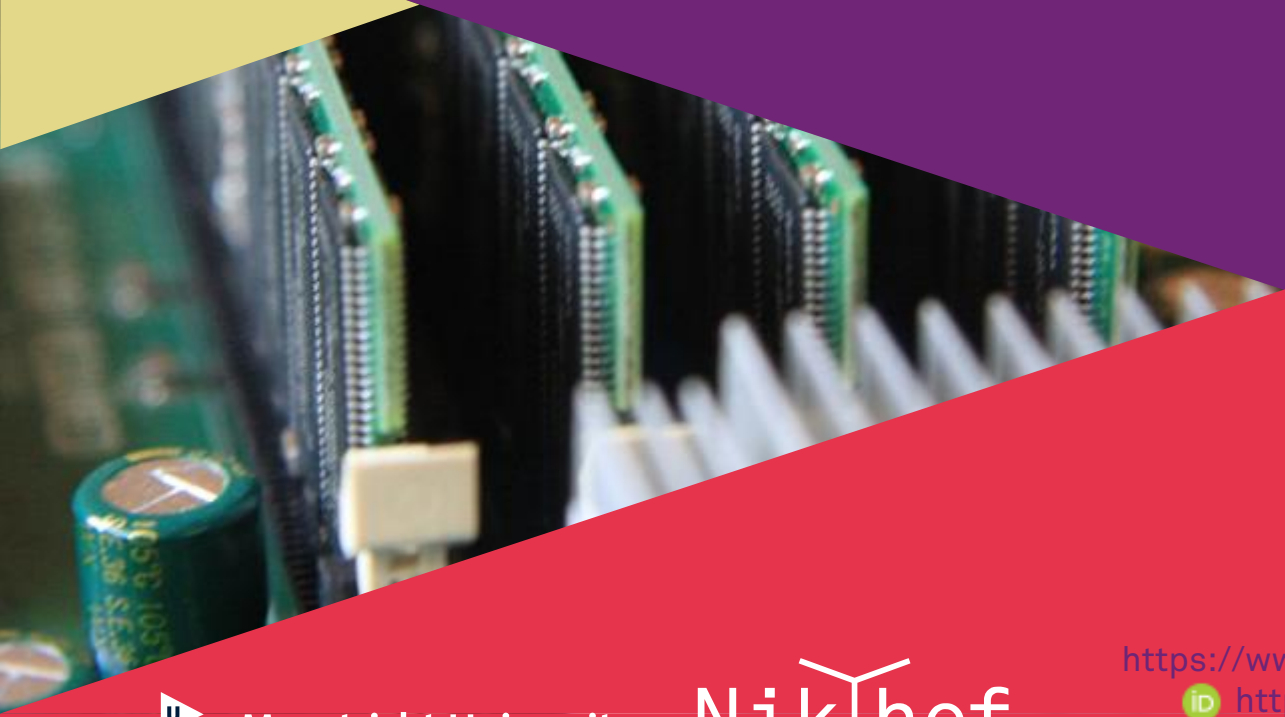
less obvious:

confirmation bias – keep analysing until it fits

- *we mostly use blinding, but that’s because we learnt …*
- *and why we plots results as a function of time!*

and some things only become apparent decades later …

Image from Christian Hill, https://scipython.com/blog/measurements-of-the-electron-charge-over-time/ (CC-BY-SA). See also Feynman, 1986
see also https://www.nwo-i.nl/en/employees/work-and-behaviour/scientific-integrity/



David Groep
davidg@nikhef.nl
https://www.nikhef.nl/~davidg/presentations/
https://orcid.org/0000-0003-1026-6606

Maastricht University

Nikhef