

Reproducible research and reformed publishing infrastructures

You can find this talk at jscaux.org/talks/

**Are you ready for
publishing reproducible research?**

Delft, 15 May 2019

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*Institute of Physics
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Plan of the talk

- Reproducible research
- SciPost
- Reforming Publishing
- Plan S
- Conclusion

When do you have to worry about reproducibility?

When you...

- try to reproduce *your own results* from # years ago
- try to check/reuse somebody else's result
- referee somebody's paper
- act as an evaluator for a grant/job search/review panel

When reproducing, what do you have to worry about?

Do you...

- have access to all required material (info; derivations; data; plot scripts...)
- have the right software to view/rerun?
- have the rights to view, modify and reuse?

Typical reproducibility mistakes by researchers

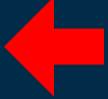
Many (most? all?) of you are guilty of:

- not properly archiving your own work
- using closed-source (deprecation timebomb) software instead of free/open alternatives
- not reproducing results before reusing them
- not publishing reproducibility-enabled results

"Fine, I see the point of reproducibility, but I don't have convincing reasons to do it"

- It costs too much time **Think longer-term!**
- Nobody reads/reproduces my stuff anyway
Most probably, someone eventually will
- Proprietary software works better than Free/Open alternatives
Most cases: bull...; and laziness costs €€€
- I can get away with not doing it
It should/will soon be mandated

To achieve reproducibility, we need renewed infrastructure

- personal-level workflows
- collaborative toolboxes
- reliable "UNIX philosophy" Free software
- publishing systems 
- evaluation systems

What is it?

A complete publishing portal
(from preprint to metadata curation)

Who runs it?

Professional scientists
(is and will remain grassroots)

What does it offer?

- Journals
- Commenting
- Metadata services

Summary?

- Openness
- Quality

What does it aim to achieve?

A complete reform of publishing at all levels

- Implement Genuine Open Access
 - two-way: free for readers, free for authors*
- Implement a healthier business model
 - *strict editorial/financial decoupling*
 - *no profit-making on the back of scientists*
 - *consortial model; not based on APCs*
- Modernize the refereeing procedure
 - *open; more credit to referees*
 - *streamline post-publication feedback*
- Reform impact assessment

Genuine Open Access Principles

Genuine Open Access Principles

[CO]	Community Ownership	The Journal has a transparent community-anchored ownership structure, and is controlled by and responsive to the scholarly community.
[OI]	Open Infrastructure	The infrastructure for operating the Journal belongs to, and is open sourced to the community. The entire technological stack and all operating protocols are documented and made easily transferable between community owners.
[CA]	Copyright to authors	Authors of articles in the Journal retain copyright. The Journal assists authors in protecting their rights in case of infringement.
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[NP]	Non Profit	The Journal publisher's operations are entirely non profit.
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[AE]	Academic Editing	The editorial processes of the Journal are run by the community, and all editorial decisions are taken by active professional scientists, using exclusively academic scholarship-based criteria.

Latest Publications

Condensed Matter Physics – Theory

Foliated fracton order from gauging subsystem symmetries

Wilbur Shirley, Kevin Slagle, Xie Chen

SciPost Phys. 6, 041 (2019) · published 2 April 2019

Condensed Matter Physics – Theory

Comparing many-body approaches against the helium atom exact solution

Jing Li, N. D. Drummond, Peter Schuck, Valerio Olevano

SciPost Phys. 6, 040 (2019) · published 1 April 2019

High-Energy Physics – Theory

Comments on one-form global symmetries and their gauging in 3d and 4d

Po-Shen Hsin, Ho Tat Lam, Nathan Seiberg

SciPost Phys. 6, 039 (2019) · published 29 March 2019

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Latest Submissions

Quantum Physics

Reproducing topological properties with quasi-Majorana states

by A. Vuik, B. Nijholt, A. R. Akhmerov, M. Wimmer

Submitted 2019-03-31 to SciPost Physics

Mathematical Physics

Thermodynamic limit of the two-spinon form factors for the zero field XXX chain

by Nikolai Kitanine, Giridhar Kulkarni

Submitted 2019-03-28 to SciPost Physics

Atomic, Molecular and Optical Physics – Experiment

Sub-Doppler laser cooling of ^{39}K via the $4S \rightarrow 5P$ transition

by Govind Unnikrishnan, Michael Gröbner, Hanns-Christoph Nägerl

Submitted 2019-03-26 to SciPost Physics

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Our future: Plan SciPost

It is time for us to be bold and unleash the next steps in our implementation plans.

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News 📰

SciPost top of the class at Crossref metadata

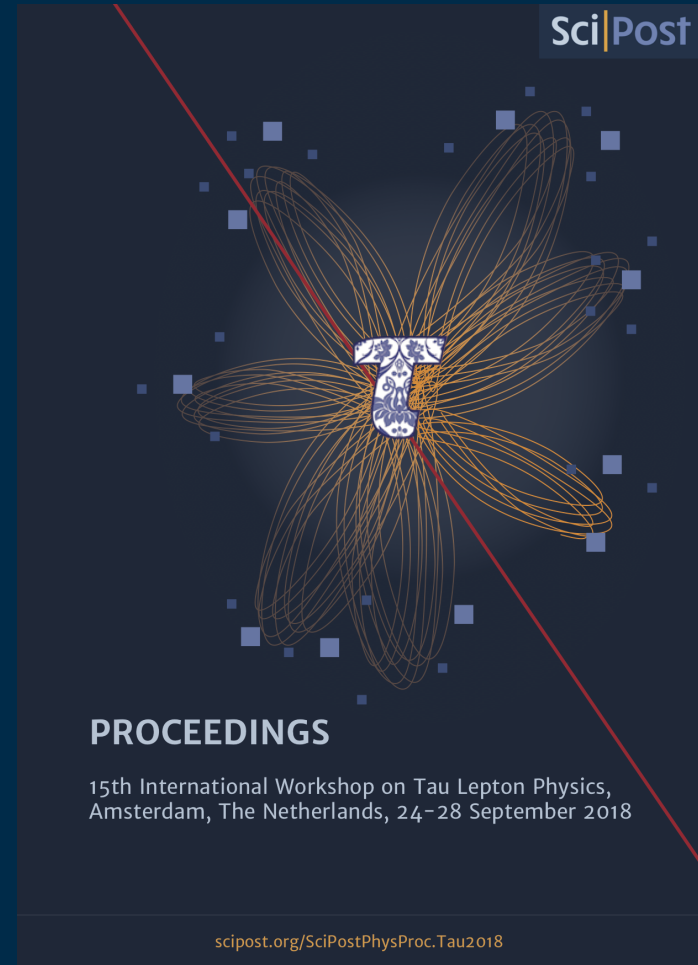
27 March 2019

An independent study of scientific metadata collections has recently highlighted the quality of our publishing services. According to Dr Habermann (Boulder, Colorado), SciPost has the most complete metadata of all 8670 CrossRef members with current collections of journal articles.

Journals

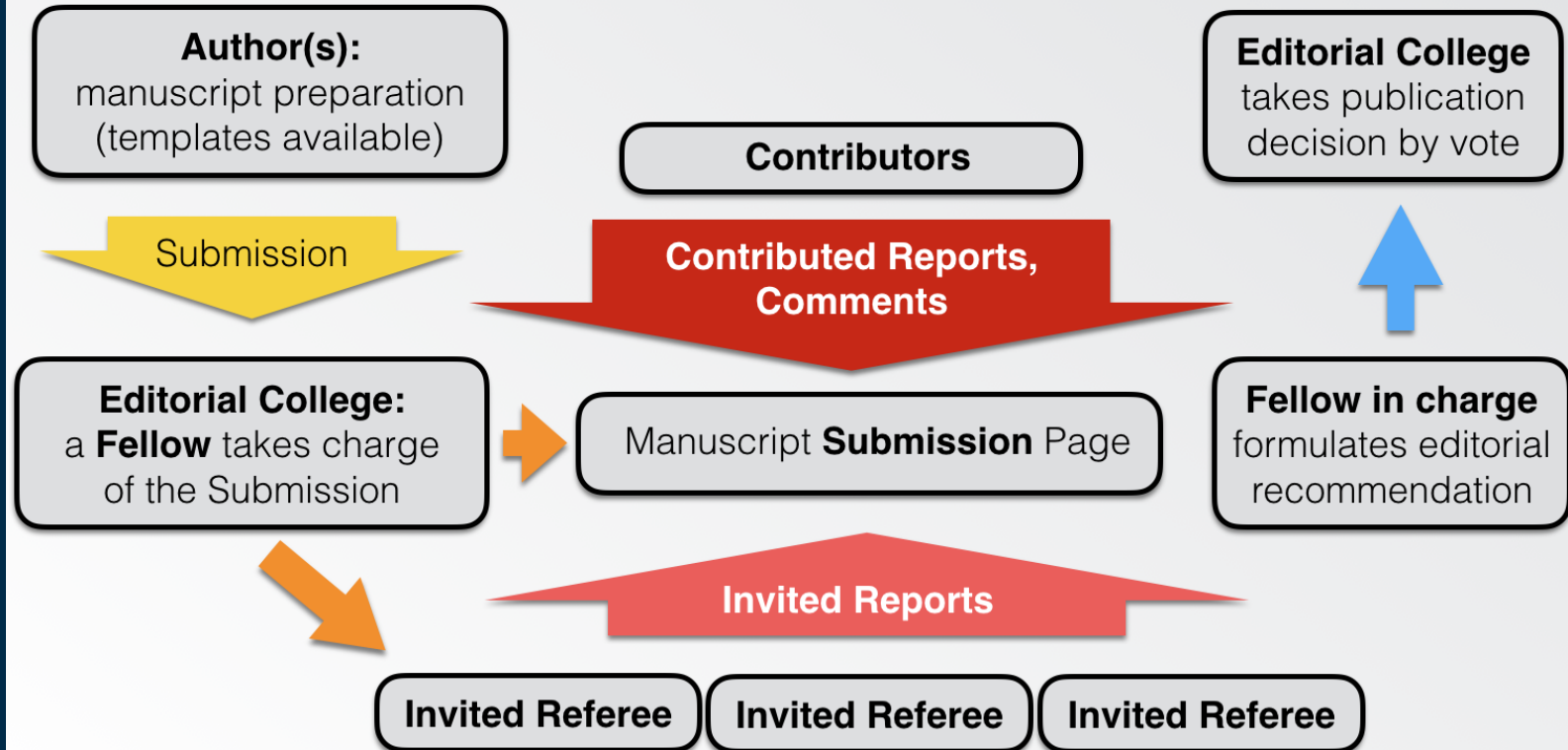
- SciPost Physics
- SP Lecture Notes
- SP Proceedings

**302 publications
as of now**

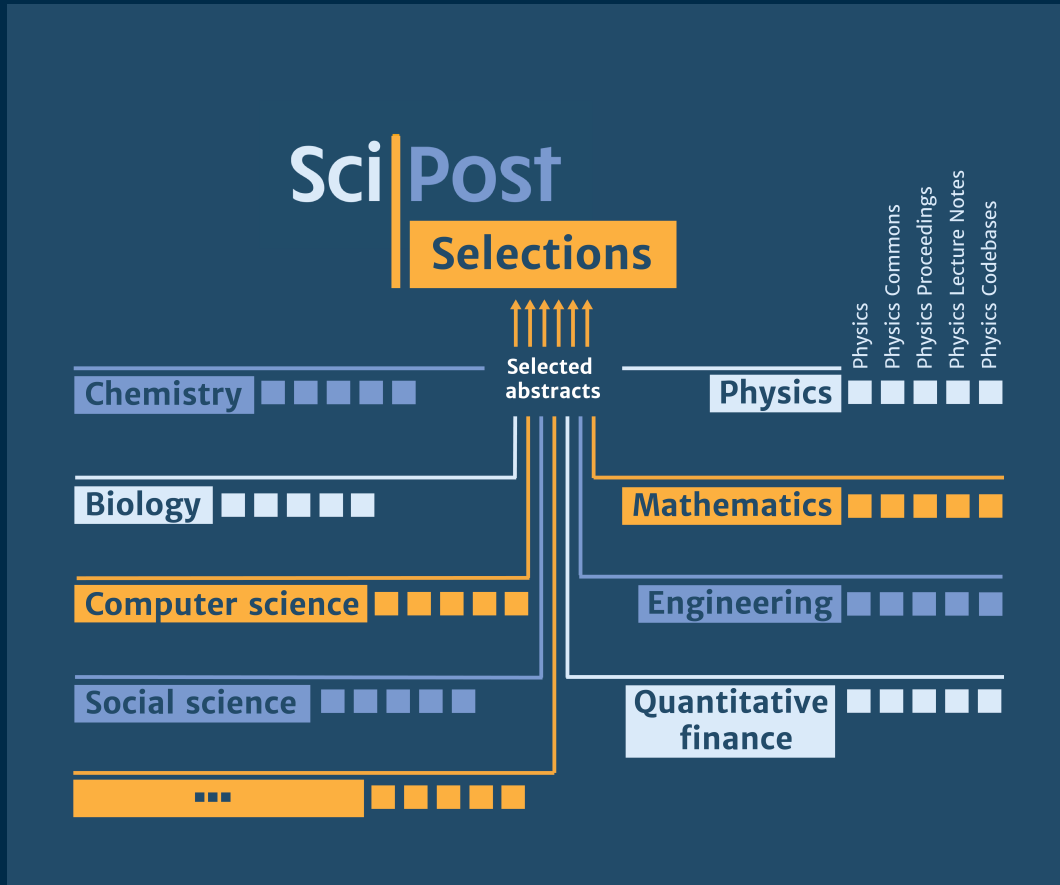


Editorial flowchart: *peer-witnessed refereeing*

Inspirations: *F1000; ACP, PLOS...*



Roadmap



- Physics upscaling
- Selections
- Codebases
- Metrics
- Meta services
- Chemistry
- Maths
- Comp. Sci. ?
- [others?]

SciPost's infrastructure

Based exclusively on Free Software

Tech stack:

SciPost's main software systems are all built from scratch, in-house

- Django *[Python web framework]*
- PostgreSQL *[database engine]*
- Node.js *[server-side javascript]*
- Bootstrap *[frontend]*
- MathJax *[LaTeX javascript engine]*
- Gitea *[git repo hub]*
- ... and many more...



Welcome to SciPost's code repositories

This site is the anchor for all the code repositories relevant to the operations of the [SciPost.org](#) scientific publication portal.

Interested in contributing?

Are you knowledgeable in modern web technology based on a Django + Postgresql stack?

Do you have working familiarity with academia in general, and scientific publishing in particular?

If you would like to join our core team of developers, please send an email to the project leader [Prof. J.-S. Caux](#) with your CV, personal details and motivations.

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<https://code.scipost.org/scipost>

J.-S. Caux

cf3736c5d0

Merge branch 'dev_JSC_20190513_simplifiedReport'

1 day ago



SciPost_v1

[Remove unused django-simple-captcha app](#)

3 days ago



colleges

[Beautify Colleges page](#)

1 day ago



commentaries

[Replace lots more django.core.urlresolvers by django.urls](#)

4 days ago



comments

[Replace lots more django.core.urlresolvers by django.urls](#)

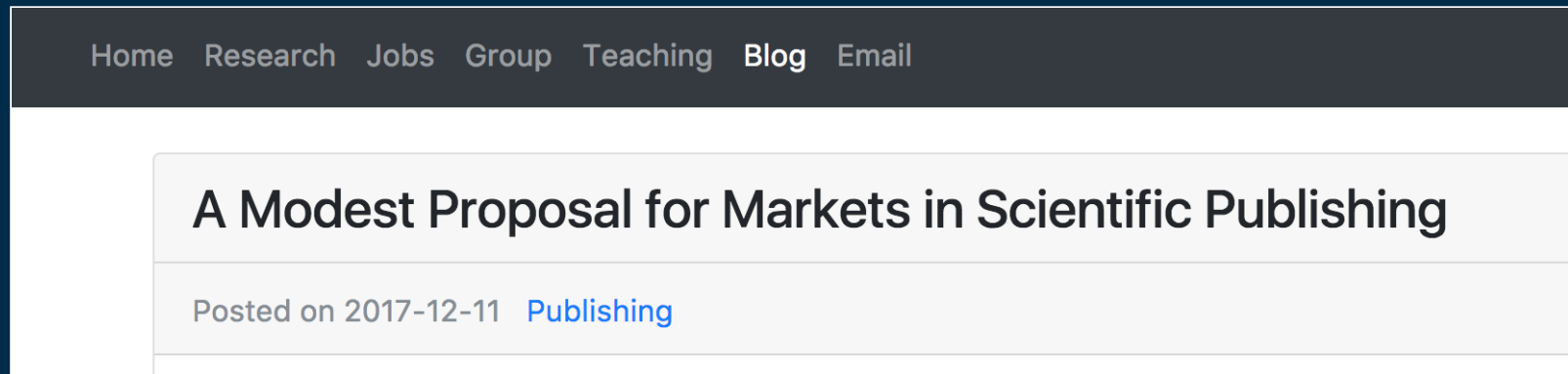
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Let's now talk
business...

I love markets!

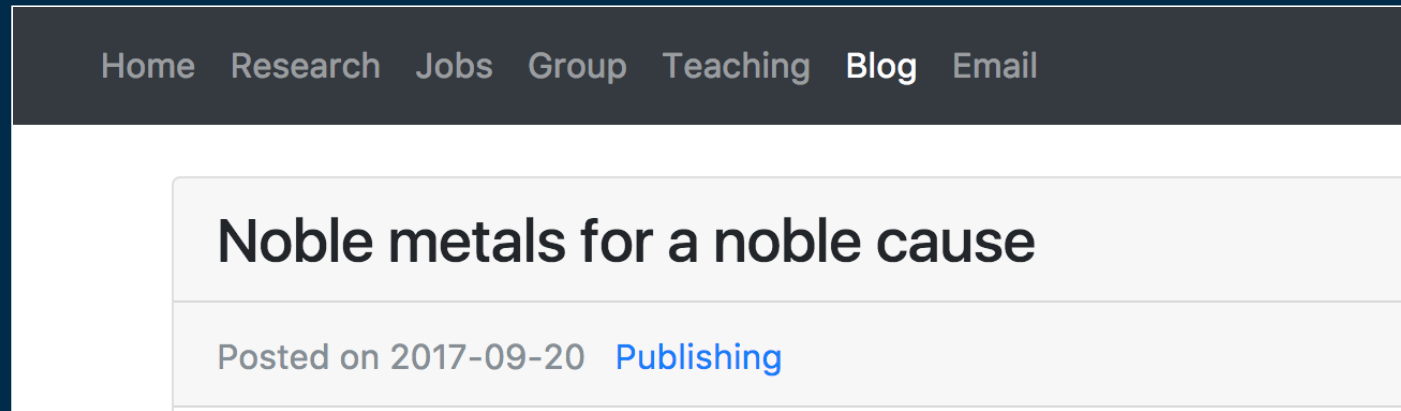
(heck, I'm from Canada, I even trained as a stock broker)

Markets work well... *except when they don't*



**Publishing: prime example of capitalism
propped up by socialism**

Classifying publishing business models



Gold [Au]

APC-based financing

Platinum [Pt]

publisher does not apply any charges to authors (APCs, submission charges or any other), and is funded through a consortial scheme or equivalent

Palladium [Pd]

publisher runs a purely not-for-profit public enterprise: none of its activities generate any profit, and all financial statements are publicly disclosed

Iron [Fe]

subscription-based financing, or pay-to-read

Lead [Pb]


editorial and financial aspects are not hermetically decoupled

Grade	Principle	Characteristics
10-karat	<i>generosity to readers: open access</i>	<ul style="list-style-type: none"> • make full text of publications freely available to readers (Creative Commons license)
14-karat	<i>generosity to authors: copyright, embargo</i>	<ul style="list-style-type: none"> • copyright is given to the authors without restrictions • publishing occurs without any embargo period
18-karat	<i>generosity to users: reuse, remix, crawl, citations</i>	<ul style="list-style-type: none"> • publication license allows reuse and remixing of content (CC BY, BY-SA or BY-NC licenses) • publisher allows text mining (software/spiders can automatically crawl journal content) • publisher makes its citation data publicly available (ideally via participation in I4OC)
22-karat	<i>generosity to reviewers: open reports</i>	<ul style="list-style-type: none"> • refereeing reports are openly visible and citable
24-karat	<i>generosity to community: academic control</i>	<ul style="list-style-type: none"> • the entire responsibility for publication decisions is in the hands of active professional scientists

SciPost's business model

- no APCs, no subscriptions *[Platinum]*
- fully not-for-profit operations *[Palladium]*
- consortial model: donations
(inspirations: arXiv, OLH, ...)

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Click on a row to see more details about the Organization, including per-year breakdowns of:

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- associated authors
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 [BE] Belgium	European Research Council [ERC] Parent: European Commission	60	Not yet



[AT] Austria

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SciPost Phys. 6, 047 (2019)
- [Quantum null energy condition and its \(non\)saturation in 2d CFTs](#)
by Christian Ecker, Daniel Grumiller, Wilke van der Schee, Shahin Sheikh-Jabbari, Philipp Stanzer,
SciPost Phys. 6, 036 (2019)
- [Search for lepton-flavour-violating decays of the \$Z\$ boson into a \$\tau\$ -lepton and a light lepton with the ATLAS detector](#)
by Wing Sheung Chan on behalf of the ATLAS collaboration,
SciPost Phys. Proc. 1, 048 (2019)
- [Multiloop functional renormalization group for the two-dimensional Hubbard model: Loop convergence of the response functions](#)
by Agnese Tagliavini, Cornelia Hille, Fabian B. Kugler, Sabine Andergassen, Alessandro Toschi, Carsten Honerkamp,
SciPost Phys. 6, 009 (2019)
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SciPost Phys. Lect. Notes 7 (2019)

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- Upon publication, authors are asked to apportion a unit of "support credit" between organizations
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- Every year, SciPost computes an average full infrastructure cost per publication
- Organizations can use this to determine their level of support

The PubFractions System

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Parent of: Aix-Marseille University, Laboratoire de Physique Théorique de la Matière Condensée, Université Pierre et Marie Curie, École Polytechnique

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Publications & PubFractions

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Pubfraction: 0.500
- [Equilibrium fluctuations in maximally noisy extended quantum systems](#)
by Michel Bauer, Denis Bernard, Tony Jin,
SciPost Phys. 6, 045 (2019)
Pubfraction: 0.300
- [Search for lepton-flavour-violating decays of the \$Z\$ boson into a \$\tau\$ -lepton and a light lepton with the ATLAS detector](#)
by Wing Sheung Chan on behalf of the ATLAS collaboration,
SciPost Phys. Proc. 1, 048 (2019)
Pubfraction: 0.000
- [Status of DUNE](#)
by Alessandra Tonazzo on behalf of the DUNE Collaboration,
SciPost Phys. Proc. 1, 043 (2019)
Pubfraction: 0.700
- [Latest results of the OPERA experiment on nu-tau appearance in the CNGS neutrino beam](#)
by N. Agafonova, A. Alexandrov, A. Anokhina, S. Aoki, A. Ariga, T. Ariga, A. Bertolin, C. Bozza, R. Brugnera, A. Buonauro, S. Buontempo, M. Chernyavskiy, A. Chukanov, L. Consiglio, N. D'Ambrosio, G. De Lellis, M. De Serio, P. del Amo Sanchez, A. Di Crescenzo, D. Di Ferdinando, N. Di Marco, S. Dmitrievsky, M. Dracos, D. Duchesneau, S. Dusini, T. Dzhatdoev, J. Ebert, A. Ereditato, J. Favier, R. A. Fini, F. Fornari, T. Fukuda, G. Galati, A. Garfagnini, V. Gentile, J. Goldberg, S. Gorbunov, Y. Gornushkin, G. Grella, A. M. Guler, C. Gustavino, C. Hagner, T. Hara, T. Hayakawa, A. Hohnagel, K. Ishiguro, A. Iuliano, K. Jakovcic, C. Jollet, C. Kamiscioglu, M. Kamiscioglu, S. H. Kim, N. Kitagawa, B. Klicek, K. Kodama, M. Komatsu, U. Kose, I. Kreslo, F. Laudisio, A. Lauria, A. Longhin, P. Loverre, M. Malenica, A. Malgin, G. Mandrioli, T. Matsuo, V. Matveev, N. Mauri, E. Medinaceli, A. Mereaglia, S. Mikado, M. Miyanishi, F. Mizutani, P. Monacelli, M. C. Montesi, K. Morishima, M. T. Muciaccia, N. Naganawa, T.

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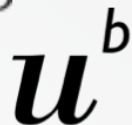
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Der Wissenschaftsfonds.



Plan S

What about Plan S?

Personally, I am *very much* in favour

How does SciPost relate to Plan S?

SciPost is (over)compliant

... but has not yet received official support from cOAlitionS (*from some members: yes it did*)

C.f. Point 3 of Plan S; *we are hopeful!*

Robert-Jan Smits @ KNAW Dec. 2018



What about reactions to Plan S?

Personally, here, I am *partly concerned*

Genuine concerns exist, but...

lots of incorrect info is being propagated

I'd prefer to think scientists as being immune to fake news and hidden agendas, but...

My hope remains that scientists will embrace the needed reform rather than undermine it

End message:

Scientists: you hold the keys to the future.
With you, full OA with reproducible research
will inevitably happen.
Without you, it won't.
So take your responsibilities and just do it.

Thanks!