

# Cultivating Open Training to advance Bio-image Analysis

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# Reusing training materials

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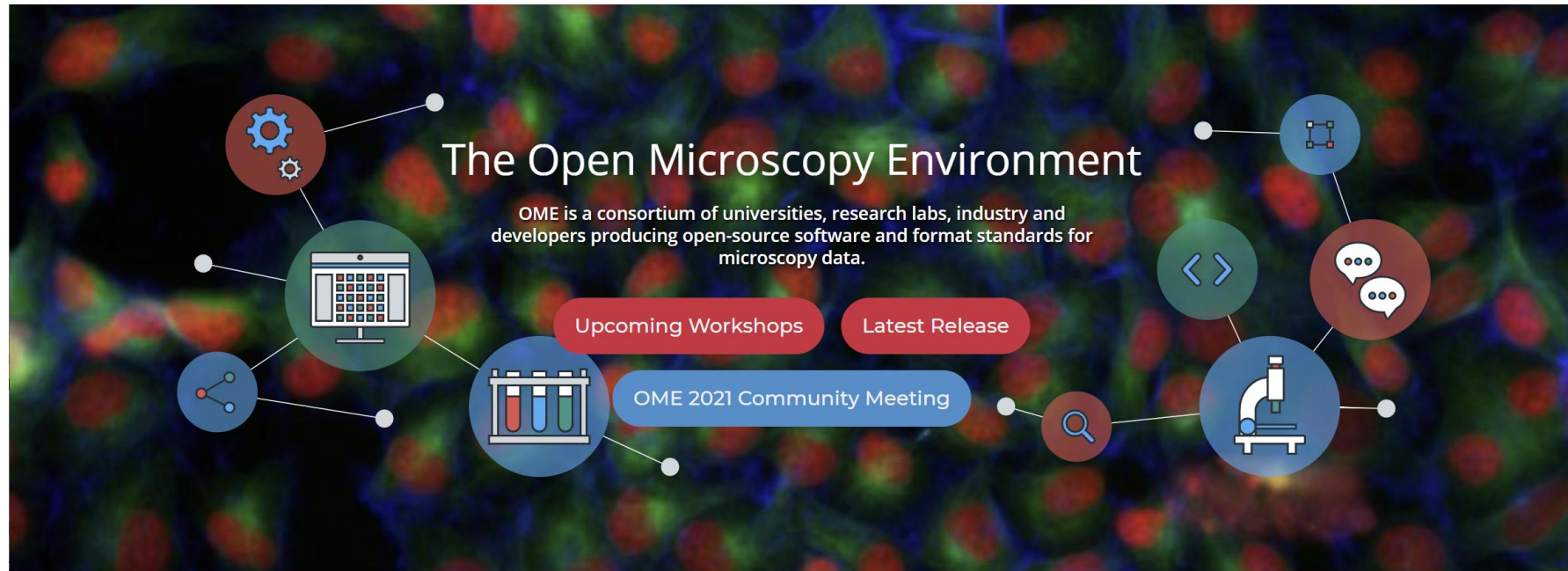


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## Example



You must put such a sentence and keep the link to CC-BY

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# Example: Restrictive licensing

The screenshot shows the bioRxiv preprint server interface. The article title is "Content-Aware Image Restoration: Pushing the Limits of Fluorescence Microscopy". The authors listed are Martin Weigert, Uwe Schmidt, Tobias Boothe, Andreas Müller, Alexandr Dibrov, Akanksha Jain, Benjamin Wilhelm, Deborah Schmidt, Coleman Broadus, Siân Culley, Mauricio Rocha-Martins, Fabián Segovia-Miranda, Caren Norden, Ricardo Henriques, Marino Zerial, Michele Solimena, Jochen Rink, Pavel Tomancak, Loïc Royer, Florian Jug, and Eugene W. Myers. The article has been published in Nature Methods with a DOI of 10.1038/s41592-018-0216-7. The article versions section shows four versions, with the current view being Version 5. The copyright notice states: "The copyright holder for this preprint is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license." A red box highlights the "CC-BY-NC-ND 4.0" part of the license.

I would love to show you a Figure from this paper!

But I'm not allowed!

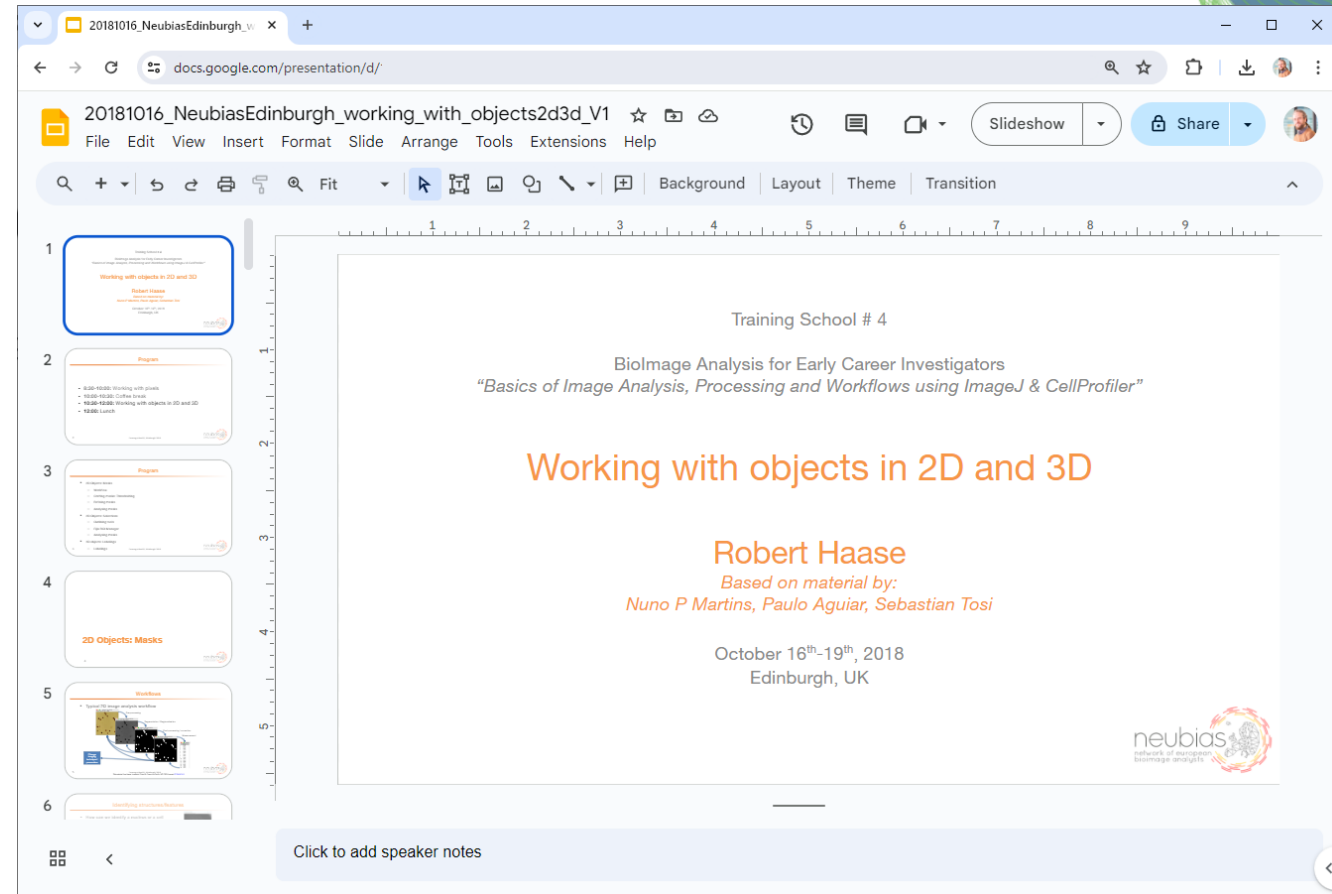
# Example: No licensing

NEUBIAS' amazing collection of online materials

- Great for learning
- Hard to find online
- Not reusable for training because of *unclear* copyright

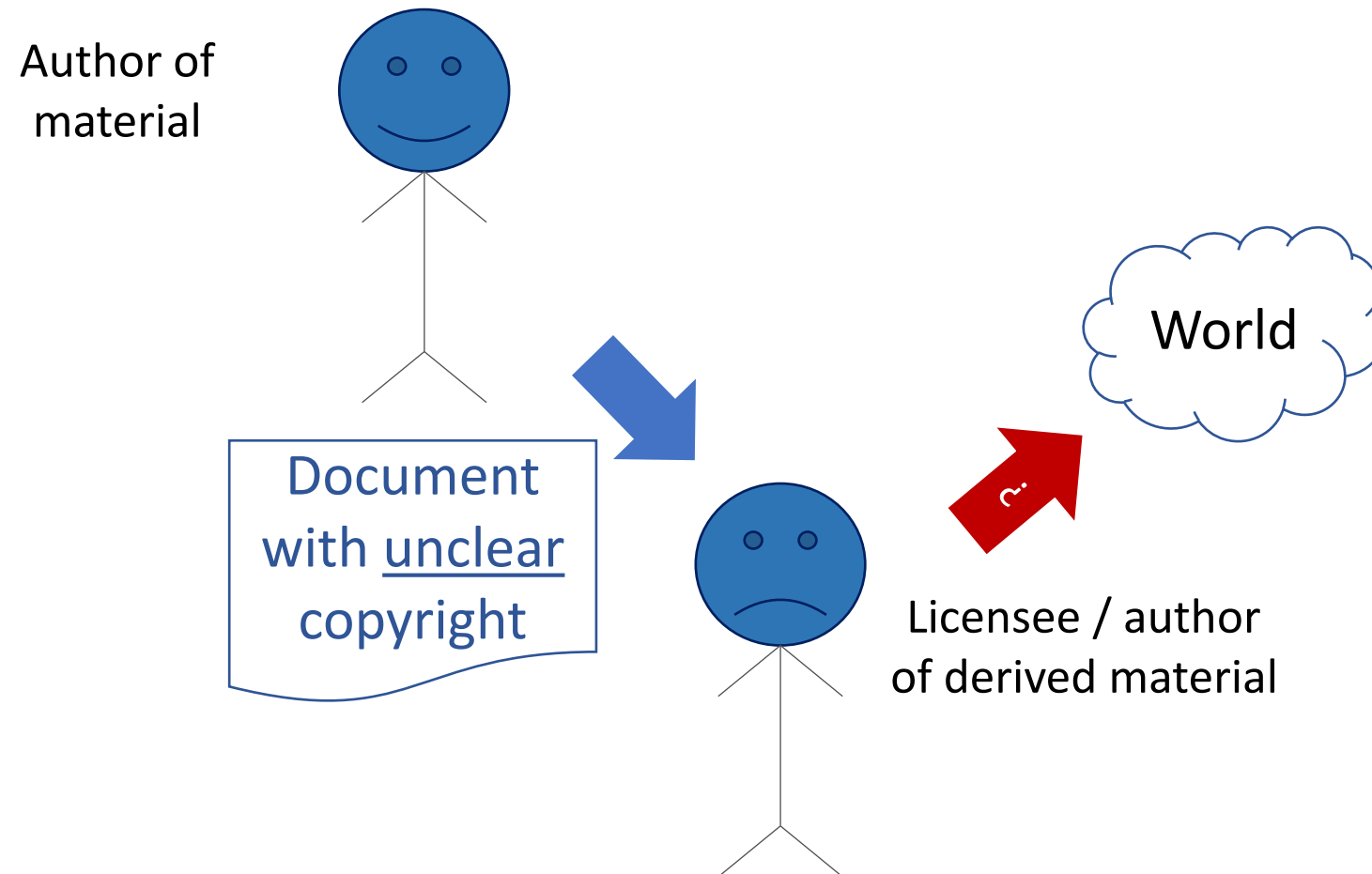
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Not FAIR

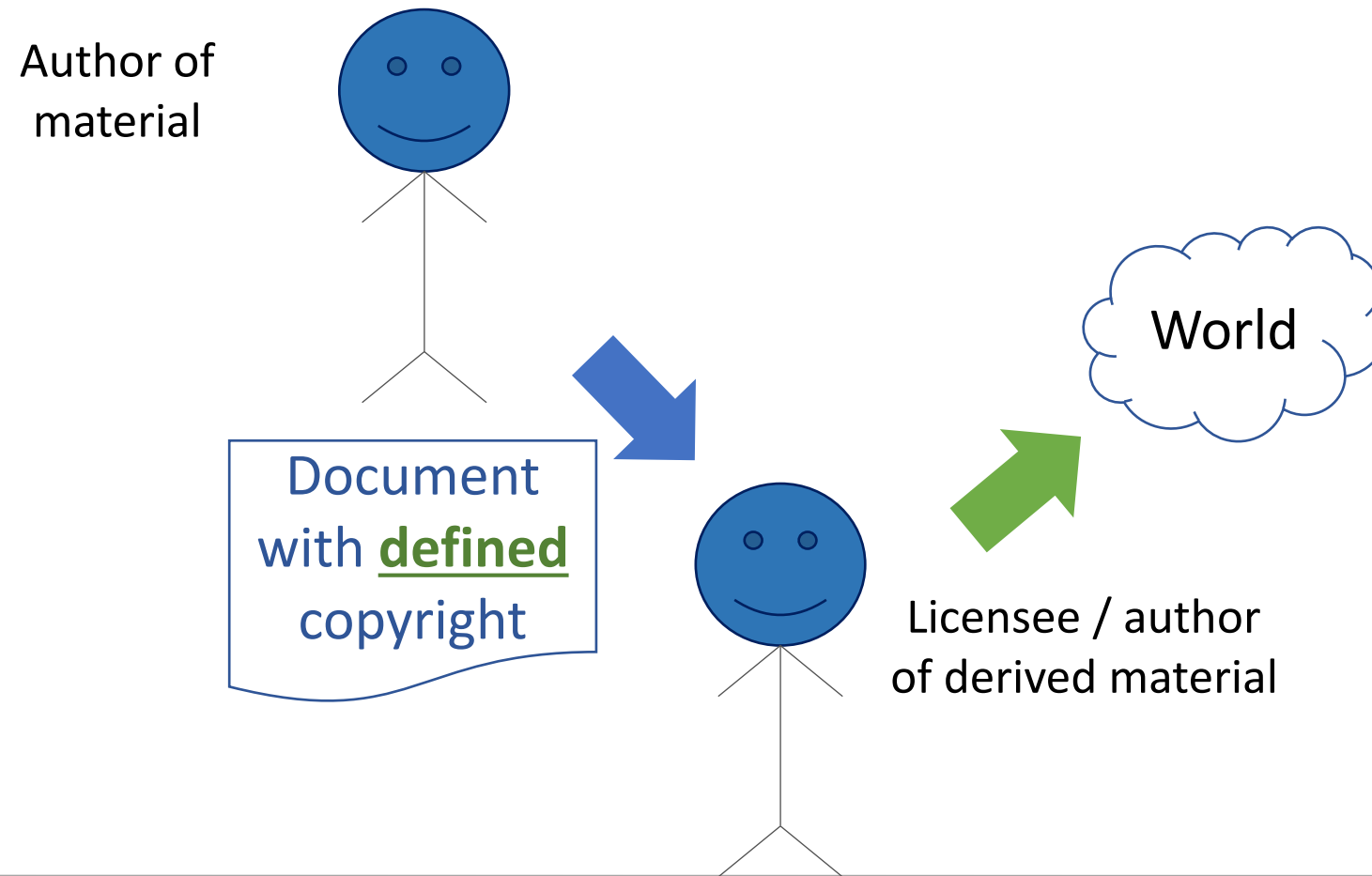




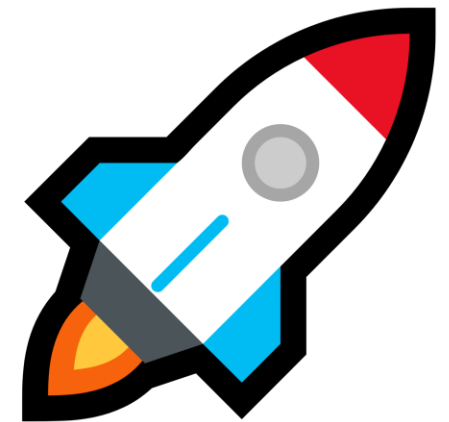
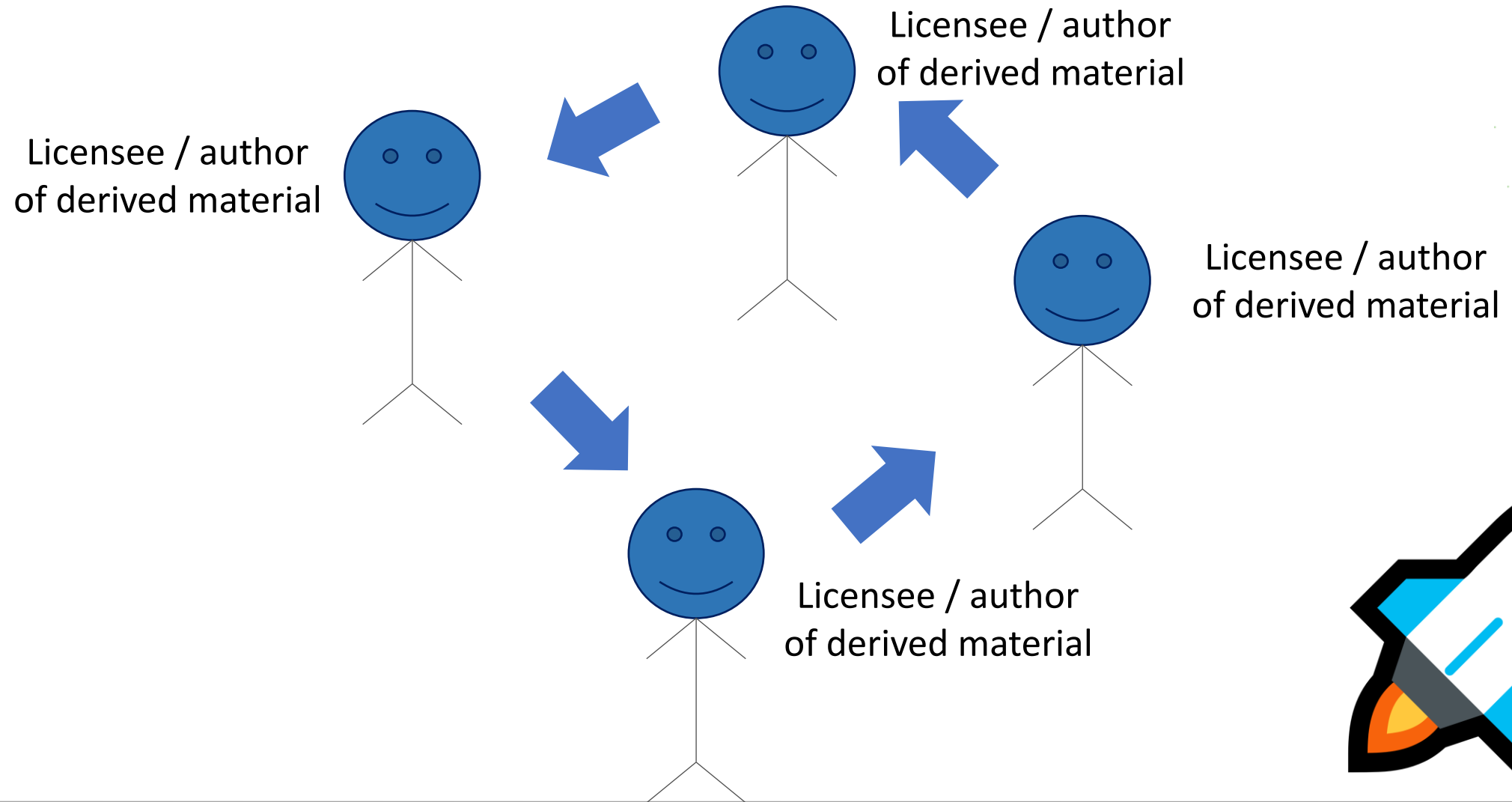
# Am I allowed to publish it?



# Am I allowed to publish it?



# Am I allowed to publish it?





# Data Management Plans (DMPs)

Define responsibilities and procedures early!



*"Data / materials we produce will be published under CC-BY 4.0"*

*"Robert will do this by end of 2025!"*

DMP

- Only if procedures are defined early, everyone can follow them.
- Licenses are important when assembling materials (-> Copyright)
- Meta-data might have *higher quality* if the person responsible for publishing the data is aware of their duties.

Are we going to publish data / materials / code?

What license can we use?

Deciding by the end of the project is too late!

# The FAIR-principles

- Findable
- Accessible
- Interoperable
- Reusable



## scientific **data**

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### The FAIR Guiding Principles for scientific data management and stewardship

[Mark D. Wilkinson](#), [Michel Dumontier](#), [IJsbrand Jan Aalbersberg](#), [Gabrielle Appleton](#), [Myles Axton](#), [Arie Baak](#), [Niklas Blomberg](#), [Jan-Willem Boiten](#), [Luiz Bonino da Silva Santos](#), [Philip E. Bourne](#), [Jildau Bouwman](#), [Anthony J. Brookes](#), [Tim Clark](#), [Mercè Crosas](#), [Ingrid Dillo](#), [Olivier Dumon](#), [Scott Edmunds](#), [Chris T. Evelo](#), [Richard Finkers](#), [Alejandra Gonzalez-Beltran](#), [Alasdair J.G. Gray](#), [Paul Groth](#), [Carole Goble](#), [Jeffrey S. Grethe](#), ... [Barend Mons](#)  [+ Show authors](#)

[Scientific Data](#) **3**, Article number: 160018 (2016) | [Cite this article](#)

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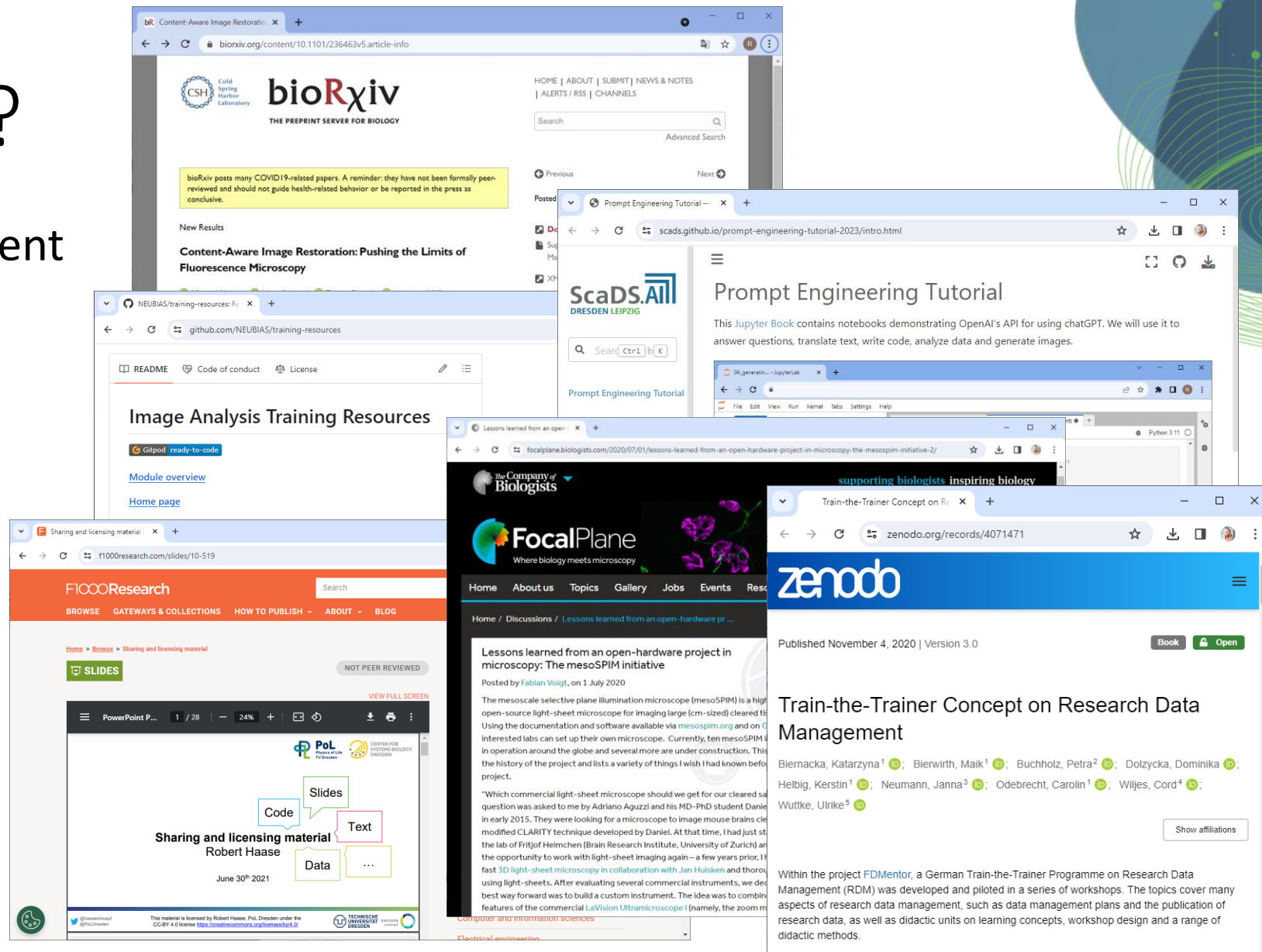
 An [Addendum](#) to this article was published on 19 March 2019

NEUBIAS Trainings happened between 2015 and 2020. It's *ok* that we didn't follow the FAIR principles *yet*.

But we could do it now. We *just* need to change our sharing culture.

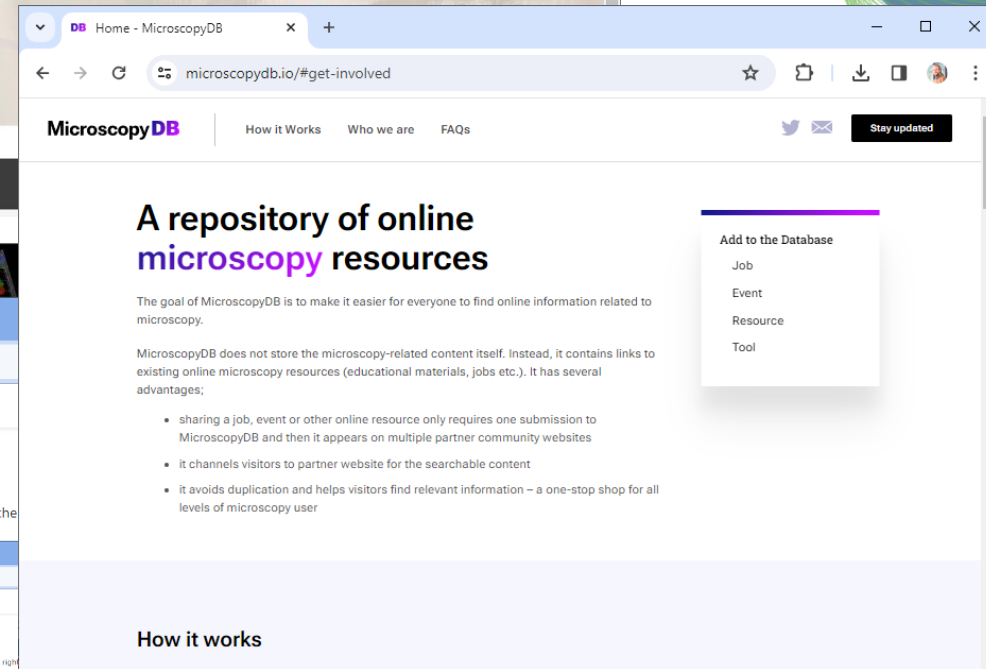
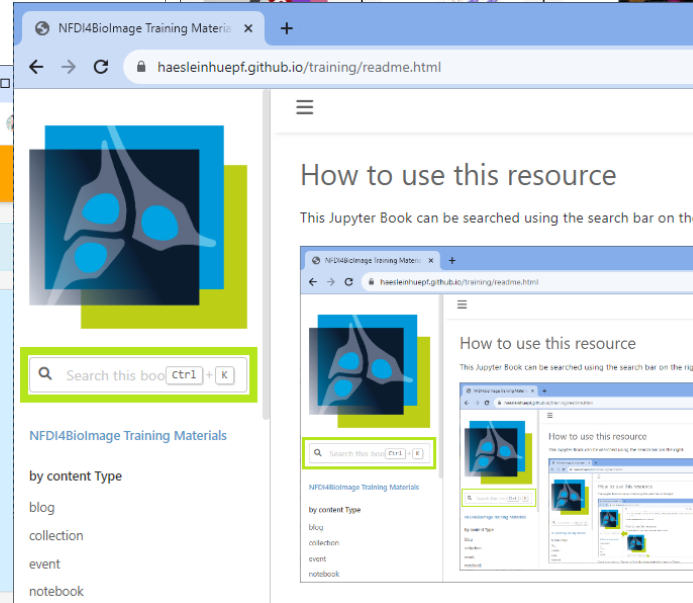
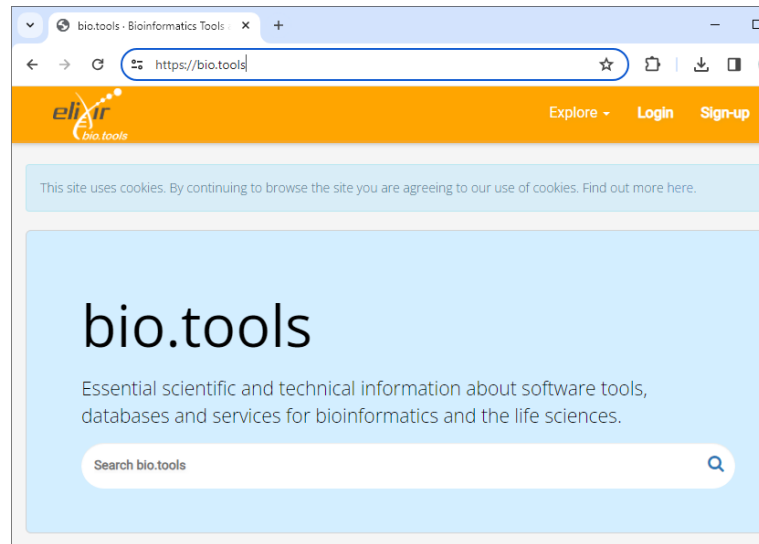
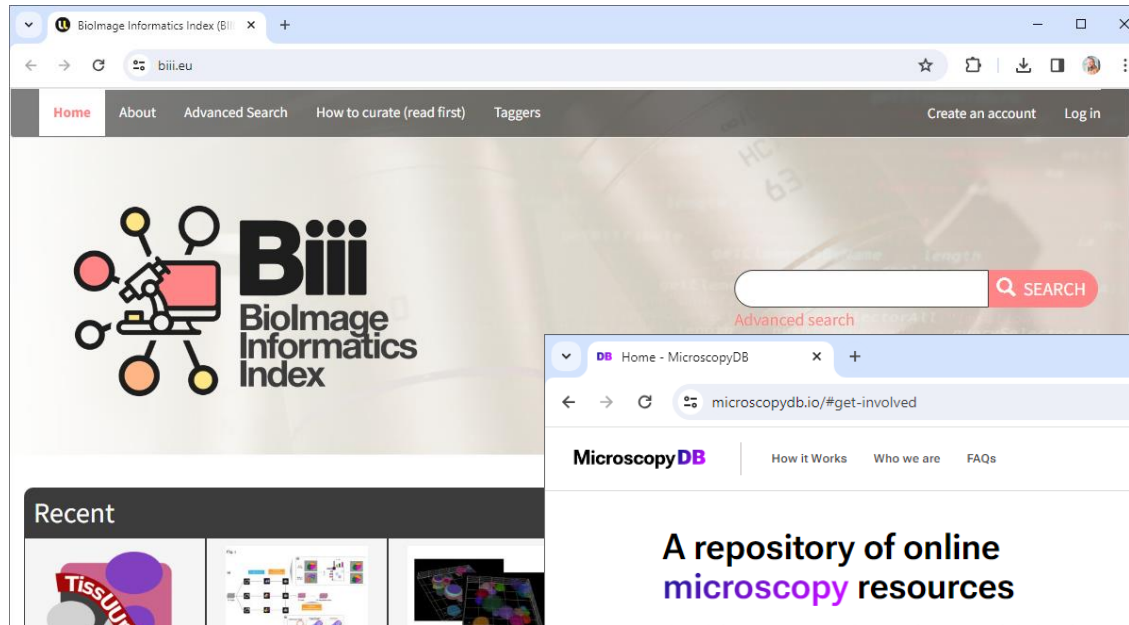
# Where to share?

- Open *training* related content
  - bioRxiv (manuscripts)
  - Figshare (figure)
  - F1000/NEUBIAS (slides)
  - Bioimage Archive (data)
  - Github (code)
  - Github pages (user docs)
  - Zenodo (data/slides)
  - Focalplane (blogs)
  - Institutional servers (if there is no alternative)



# Findability

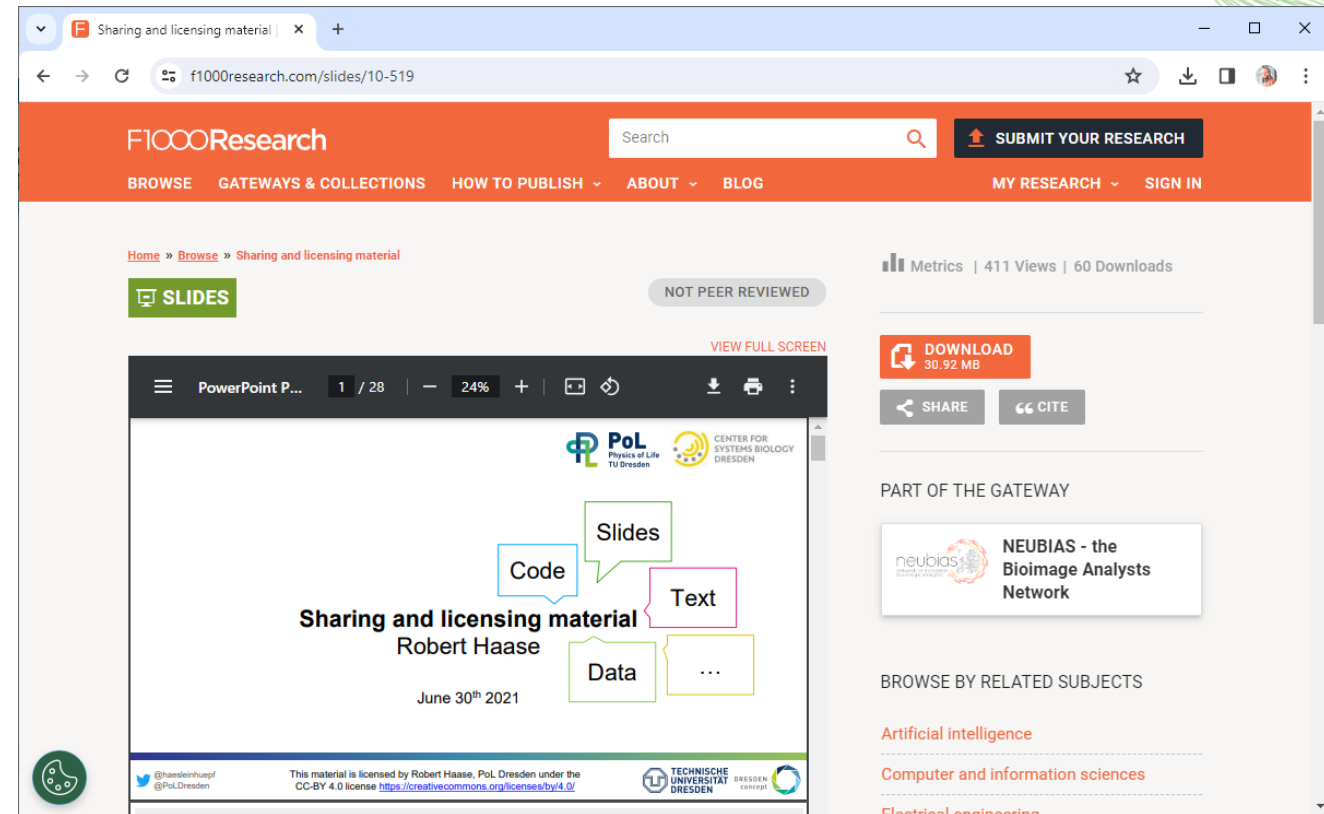
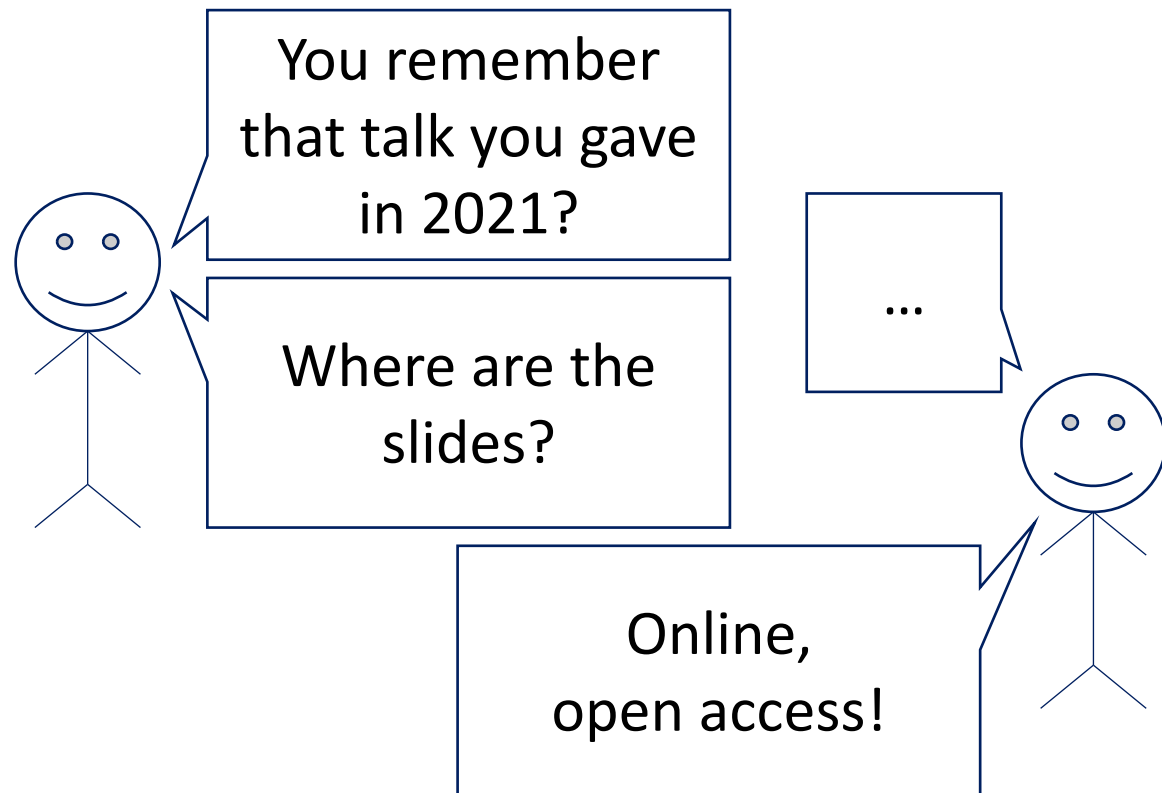
- Make sure your materials are listed in public search indices
- Do not trust google to make your stuff findable





# Incentives: Findability

Your *future-self* will thank you, because they will find your work

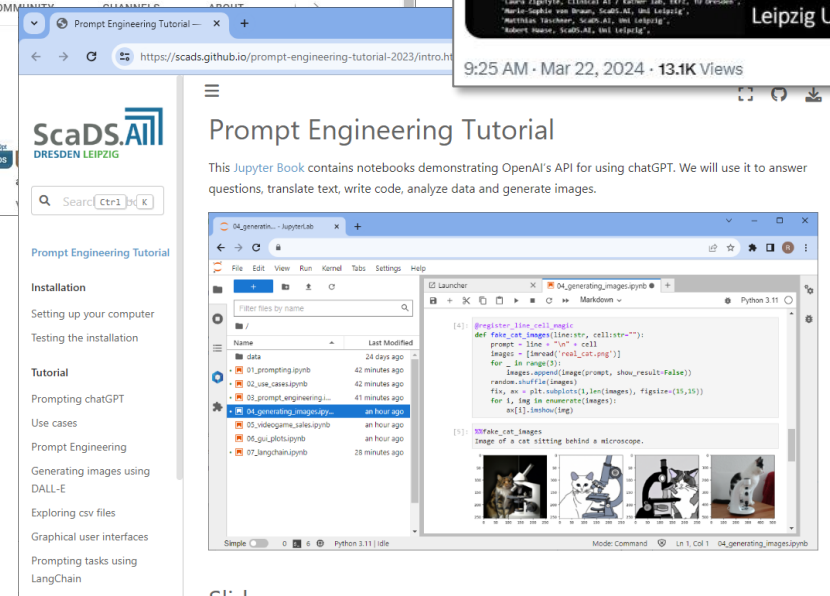
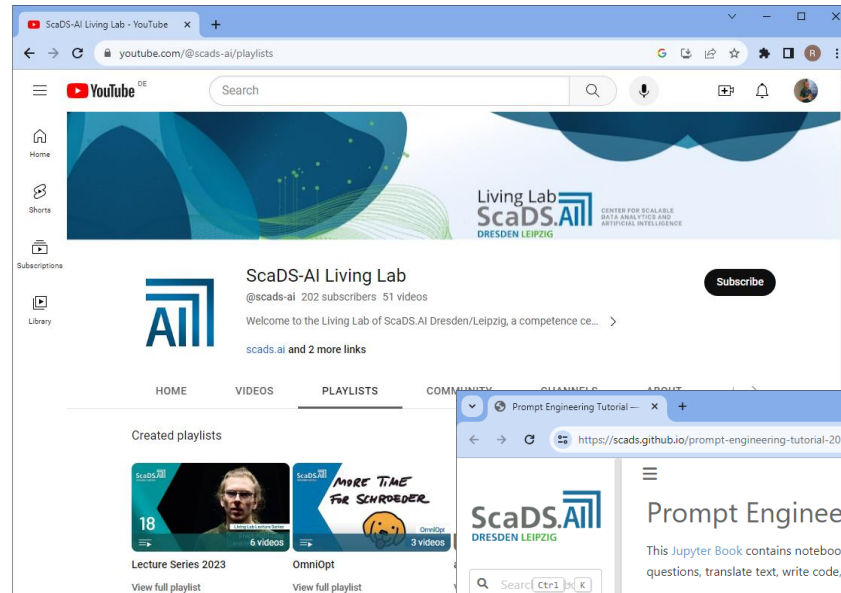


# Incentives: Findability -> Visibility

- YouTube
  - Github
  - X/Twitter
- } Social networks

Open & FAIR Training  
is a PR instrument

- ... leading to
- more software users
  - more course attendees
  - new collaborations

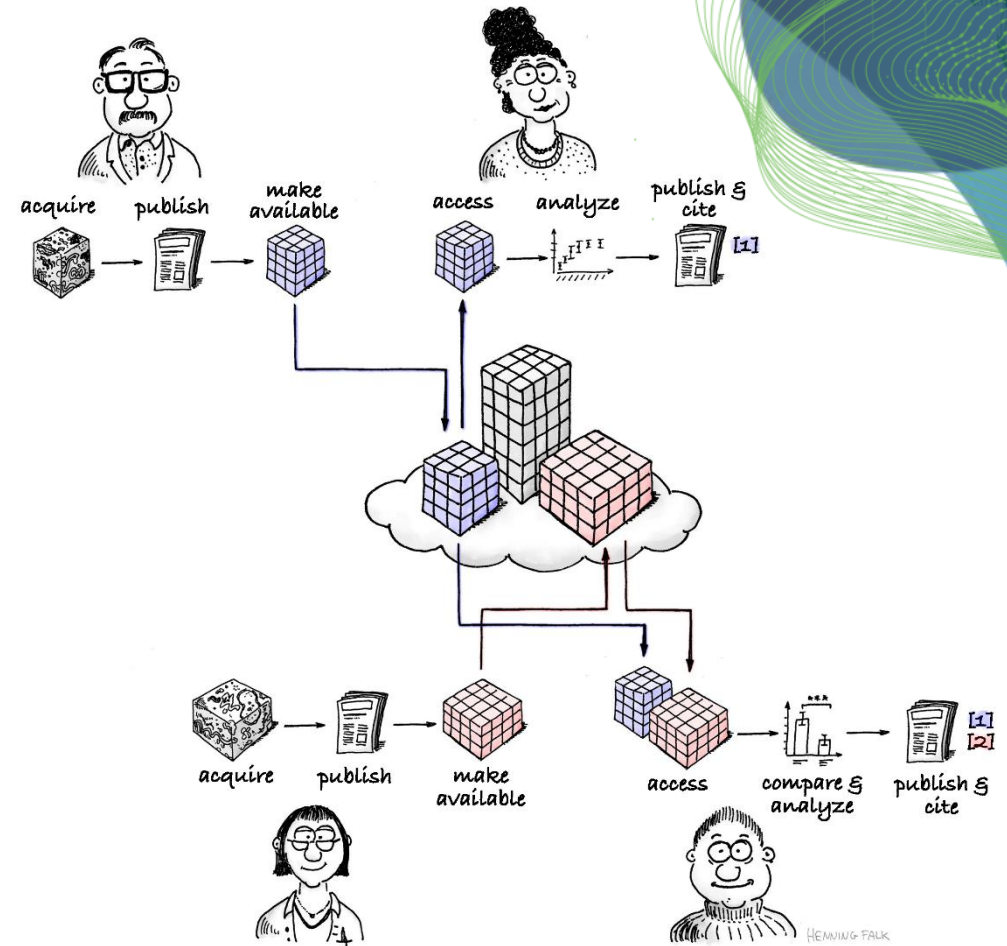




# The FAIR-principles

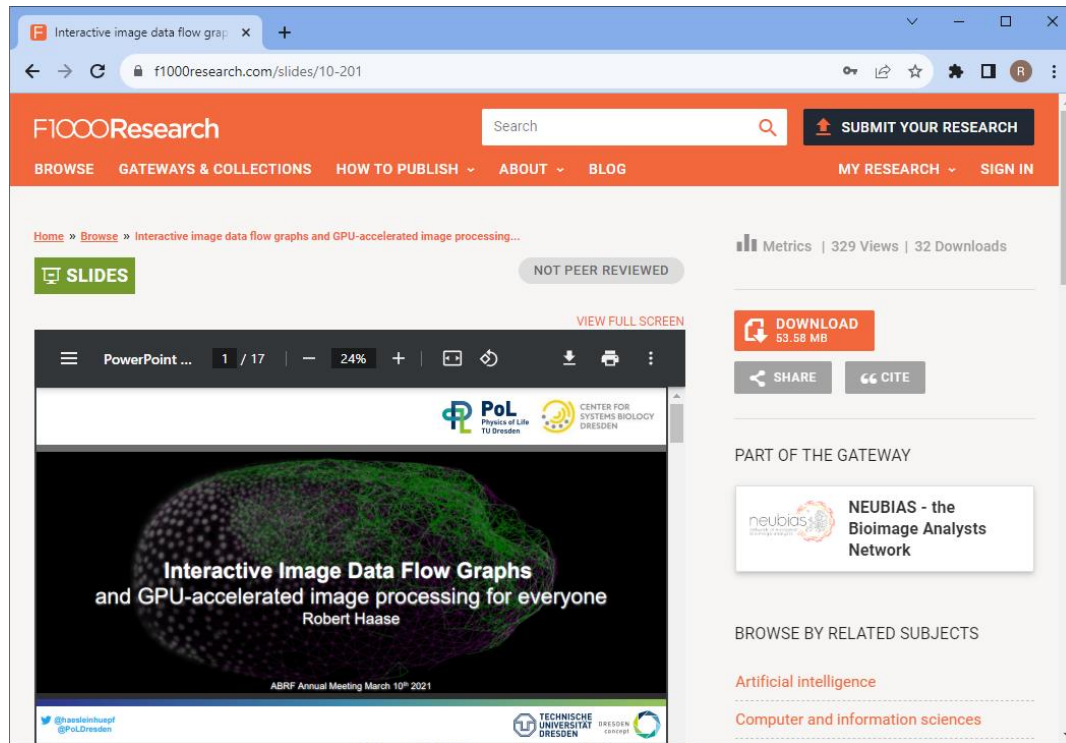
## Reusable

- R1. (Meta)data are richly described with a plurality of accurate and relevant attributes
- R1.1. (Meta)data are released with a clear and accessible data usage license
- R1.2. (Meta)data are associated with detailed provenance
- R1.3. (Meta)data meet domain-relevant community standards



# Incentives: Reusability






- Open Access -> Others teach how to use your tools & methods



# The FAIR-principles

## Making things reusable?

The screenshot shows the bioRxiv submission interface. The 'Distribution/Reuse Options' section is highlighted, showing a list of license options with their corresponding icons. The options are: 'No reuse/adaptation without permission' (CC icon), 'Attribution CC-BY-NC-ND' (CC BY NC ND icons), 'Attribution CC-BY-ND' (CC BY ND icons), 'Attribution CC-BY-NC' (CC BY NC icons), 'Attribution CC-BY' (CC BY icons), 'CC0 (non-Gov't)' (CC0 icon), and 'CC0 (US Gov't)' (CC0 icon). The 'Attribution CC-BY-NC-ND' option is selected.

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# Licensing: Permissive versus restrictive

	Download and share for free	Reuse parts, e.g. Figures	Reuse parts, e.g. in paid training
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CC-BY-SA	✓ Only under CC-BY-SA	✓ Only under CC-BY-SA	✓ Only under CC-BY-SA
CC-BY-NC	✓	✓ (if free of charge)	✗
CC-BY-ND	✓	✗	✗
CC-BY-NC-ND	✓	✗	✗

Bad for the progress of science

In particular in the training context

# Licensing: Permissive versus restrictive

If you decide for a **Non-Derivatives (ND)** or **Non-Commercial (NC)** license, please have a good reason to do so. These two prohibit reuse of your materials, e.g. paid trainings.



# Licensing: Permissive versus restrictive

- Restrictive
  - You can reuse our stuff, but only if you ...
    - License your work with the same license we do
    - Make your stuff openly available
    - Make no money with derivatives of our work
  - Examples: **GPL, CC-BY-SA, CC-BY-NC, CC-BY-ND**
- Permissive licensing:
  - Do whatever you like with our stuff, just make sure to mention / cite us ...
  - Examples: **BSD, MIT, Apache, CC-BY**

I conclude,  
these are  
*less open* in  
a sense







# Take home message

If you share material (openly or not)

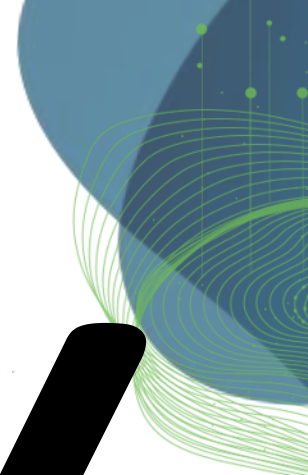
license it

and it'll be harder to steal it



Please use

CC-BY



as license for your materials to make them reusable.

# Summary

- If you want to make your stuff reusable:
  - Share it on community-wide platforms (not institutional servers)
  - Register them in search-indices
  - Use permissive licenses
- Read more:
  - A Call for FAIR and Open-Access Training Materials to advance Bioimage Analysis  
<https://osf.io/2zgmc> with Christian Tischer, Pete Bankhead, Kota Miura and Beth Cimini
  - Sharing on Zenodo  
<https://focalplane.biologists.com/2023/02/15/sharing-research-data-with-zenodo/>
  - Sharing on Figshare, by Elisabeth Kugler  
<https://focalplane.biologists.com/2023/07/26/sharing-your-poster-on-figshare/>
  - Collaborative work on github  
<https://focalplane.biologists.com/2021/09/04/collaborative-bio-image-analysis-script-editing-with-git/>
  - Licensing  
<https://focalplane.biologists.com/2023/05/06/if-you-license-it-itll-be-harder-to-steal-it-why-we-should-license-our-work/>



<https://doi.org/10.5281/zenodo.11065721>

# Acknowledgements

## Communities & platforms



NFDI 4  
BIOIMAGE



Global BioImage  
Analysts' Society



network of european  
bioimage analysts



Where biology meets microscopy



SaxFDM



## BiAPoL team

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  - Stefan Hahmann
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- Ryan George Savill
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  - Somashekhar Kulkarni
  - Till Korten



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und Forschung



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