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## BINARY BLACK HOLE SIGNALS IN LIGO OPEN DATA

Version 1.63, 2017 Sept 11

Welcome! This Jupyter notebook (or associated python script LOSC\_Event\_tutorial.py) through some typical signal processing tasks on strain time-series data associated with event data releases from the LIGO Open Science Center (LOSC):

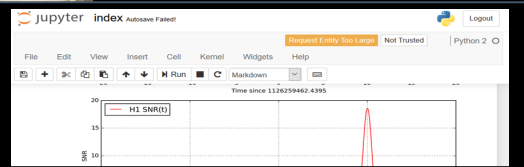
- Find events at <https://losc.ligo.org/events/>.
- View the tutorial as a [web page for GW150914](https://losc.ligo.org/docs/GW150914/).
- Run this tutorial with Binder using the link on the [tutorials](#) page.
- If you are running this tutorial on your own computer, see the [Localhost](#) section.
- This notebook works with nbformat version 4. If you are running version 3, pick the [tutorials](#) page.
- After setting the desired "eventname" below, you can just run the full notebook.











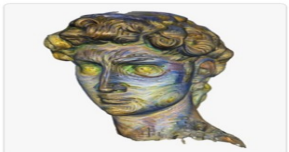

Questions, comments, suggestions, corrections, etc: email [losc@ligo.caltech.edu](mailto:losc@ligo.caltech.edu)

**This tutorial is intended for educational purposes, shown here is not used to produce results papers by the LIGO Scientific Collaboration, which instead special purpose analysis software packages.**

For publicly available, gravitational-wave software analysis packages used to produce LSC and Virgo Collaboration results papers see <https://losc.ligo.org/software/>.

For technical notes on this tutorial, see [https://losc.ligo.org/bbh\\_tutorial\\_notes/](https://losc.ligo.org/bbh_tutorial_notes/).



 <p>SECTION 1 Aligned Feature Vis Interpolation</p> <p>TRY IN A  NOTEBOOK</p>	 <p>SECTION 2 Style Transfer in Fourier Space</p> <p>TRY IN A  NOTEBOOK</p>	 <p>SECTION 3 Feature Vis with CPPNs</p> <p>TRY IN A  NOTEBOOK</p>
 <p>SECTION 4 Feature Vis with Transparency</p> <p>TRY IN A  NOTEBOOK</p>	 <p>SECTION 5 Feature Vis in 3D</p> <p>TRY IN A  NOTEBOOK</p>	 <p>SECTION 6 Style Transfer in 3D</p> <p>TRY IN A  NOTEBOOK</p>

# Scientific publishing using interactive notebooks

Link to this doc

[tiny.cc/df37zy](https://tiny.cc/df37zy)

Dr Caspar Addyman

@czzpr

Goldsmiths, University of London



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News > Science

# Two stars crash into each other, wobbling the universe and flinging out huge amounts of gold

The discovery opens a 'new chapter in astrophysics', say experts, and has been described as one of the most exciting ever

Andrew Griffin | [@\\_andrew\\_griffin](#) | Monday 16 October 2017 13:43 BST | [148 comments](#)

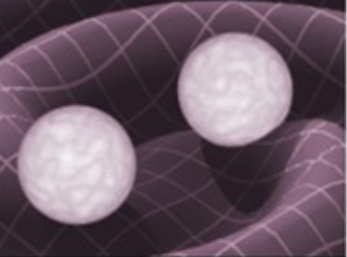
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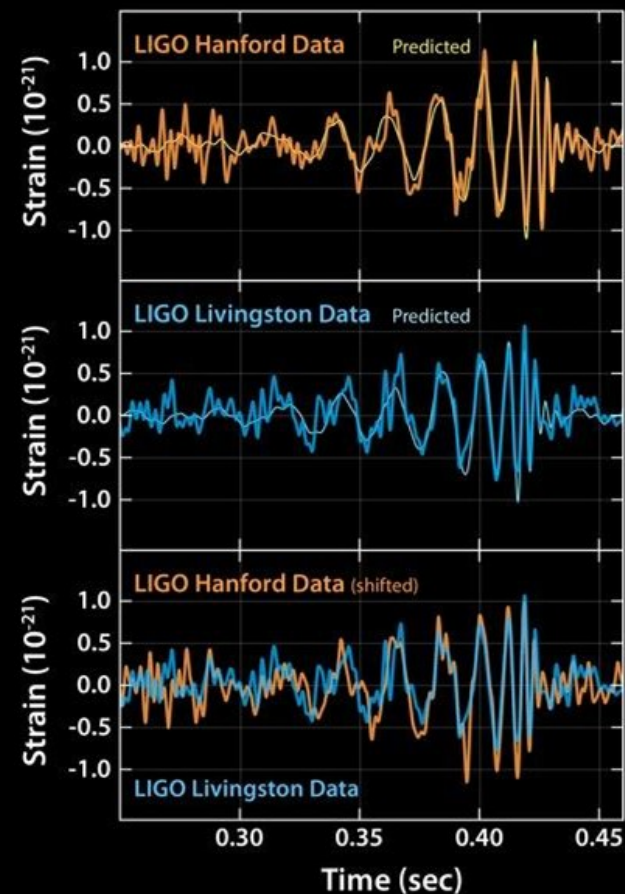
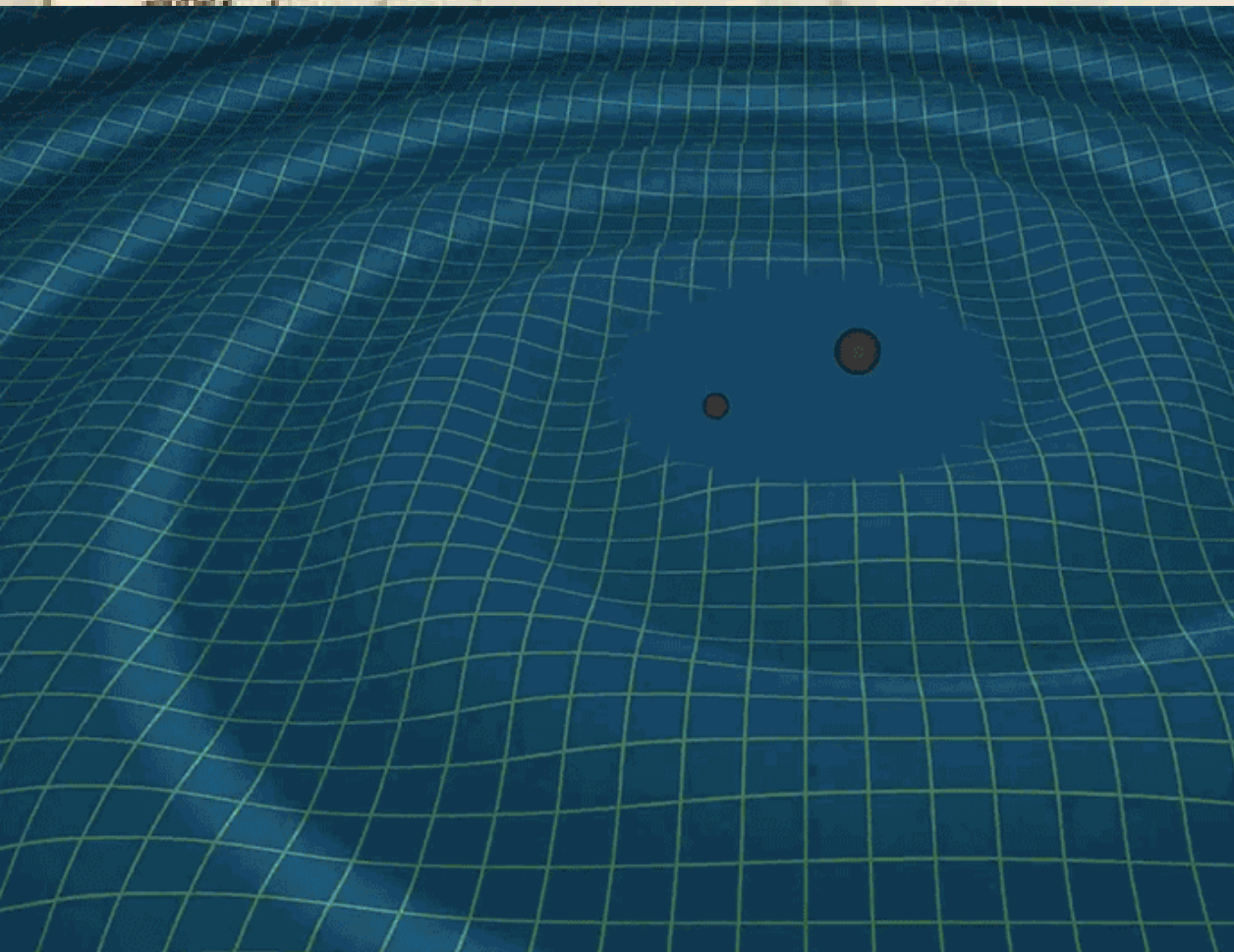


# LIGO

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Gravitational-Wave Observatory  
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The figure consists of three vertically stacked plots, all sharing the same x-axis: "Time since 1126259462.4395" ranging from -0.15 to 0.05. The top plot shows "H1 SNR(t)" with a red line and a prominent peak at t=0. The middle plot, titled "H1 whitened data around event", shows "whitened strain (units of noise stdev)" with a red line for "H1 whitened h(t)" and a black line for "Template(t)". The bottom plot, titled "H1 Residual whitened data after subtracting template around event", shows "whitened strain (units of noise stdev)" with a red line for "H1 resid", which is significantly reduced in amplitude compared to the original whitened data.

[losc.ligo.org/tutorials/](https://losc.ligo.org/tutorials/)



Adams, J. (2012). Collaborations: The rise of research networks. *Nature*, 490(7420), 335-336.

[tiny.cc/uh1xjy](https://tiny.cc/uh1xjy)



SECTION 1  
**Aligned Feature Vis Interpolation**

TRY IN A  NOTEBOOK



SECTION 2  
**Style Transfer in Fourier Space**

TRY IN A  NOTEBOOK



SECTION 3  
**Feature Vis with CPPNs**

TRY IN A  NOTEBOOK



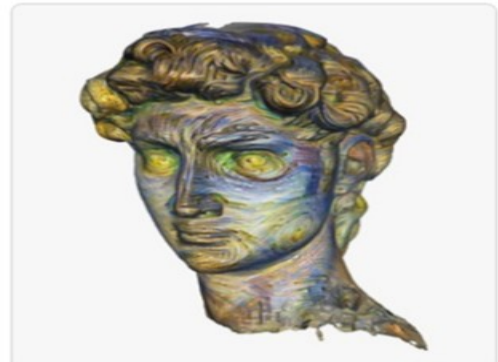
SECTION 4  
**Feature Vis with Transparency**

TRY IN A  NOTEBOOK



SECTION 5  
**Feature Vis in 3D**

TRY IN A  NOTEBOOK



SECTION 6  
**Style Transfer in 3D**

TRY IN A  NOTEBOOK



# Social Facilitation of Laughter and Smiles in Preschool Children

Caspar Addyman<sup>1\*</sup>, Charlotte Fogelquist<sup>2</sup>, Lenka Levakova<sup>2</sup> and Sarah Rees<sup>2</sup>

<sup>1</sup> Department of Psychology, Goldsmiths, University of London, London, United Kingdom, <sup>2</sup> Department of Psychological Sciences, Birkbeck, University of London, London, United Kingdom

Surprisingly little is known about the social dimensions of laughter in preschool children. We studied children's responses to amusing video clips in the presence or absence of peers. The sample consisted of 9 boys and 11 girls aged 31–49 months ( $M$  39.8,  $SD$  4.2) who watched three cartoons under three different conditions: individually, in pairs, or in groups of 6 or 8. The social viewing conditions showed significantly higher numbers of laughs and smiles than the individual viewing condition. On average children laughed eight times as much in company as on their own and smiled almost three times as much. No differences were found between pairs and groups, and no association was found between subjective funniness ratings and group size. This suggests that the presence of even a single social partner can change behavior in response to humorous material. It supports the idea that laughter and smiles are primarily flexible social signals rather than reflexive responses to humor.

## OPEN ACCESS

**Edited by:**

Gabrielle Strouse,  
University of South Dakota,  
United States

**Keywords:** preschoolers, laughter, smiles, humor, peer groups

## RESULTS

To investigate the social role of laughter and smiles in preschool children watching funny videos, laughter, smiles and funniness ratings were looked at separately. All analysis was performed using the R statistics language, version 3.4.2 with ANOVA performed using CRAN packages ez, version 4.4.0 (Lawrence, 2016) and power calculations using package pwr, version 1.2.1 (Champely, 2017). The data, the analysis scripts and the code to generate all figures are provided in the online materials (Addyman et al., 2017). **Table 2** shows the descriptive statistics and **Table 3** the pairwise correlations for all the main experimental variables.

## REFERENCES

- Addyman, C., and Addyman, I. (2013). The science of baby laughter. *Comedy Stud.* 4, 143–153. doi: 10.1386/cost.4.2.143
- Addyman, C., Fogelquist, C., Levakova, L., and Rees, S. (2017). Social laughter in preschool children: dataset, analysis scripts and supporting materials. *FigShare* doi: 10.6084/m9.figshare.5549356
- Bandura, A. (1978). Social learning theory of aggression. *J. Commun.* 28, 12–29. doi: 10.1111/j.1460-2466.1978.tb01621.x
- Brackett, C. W. (1933). Laughing and crying of preschool children. *J. Exp. Educ.* 2, 119–126. doi: 10.1080/00220973.1933.11009932

[doi.org/10.6084/m9.figshare.5549356](https://doi.org/10.6084/m9.figshare.5549356)



# Social facilitation of laughter and smiles in preschool children

## Data analysis

Caspar Addyman, Charlotte Folquist, Lenka Levakova, Sarah Rees

Birkbeck University of London

### Abstract

## Abstract

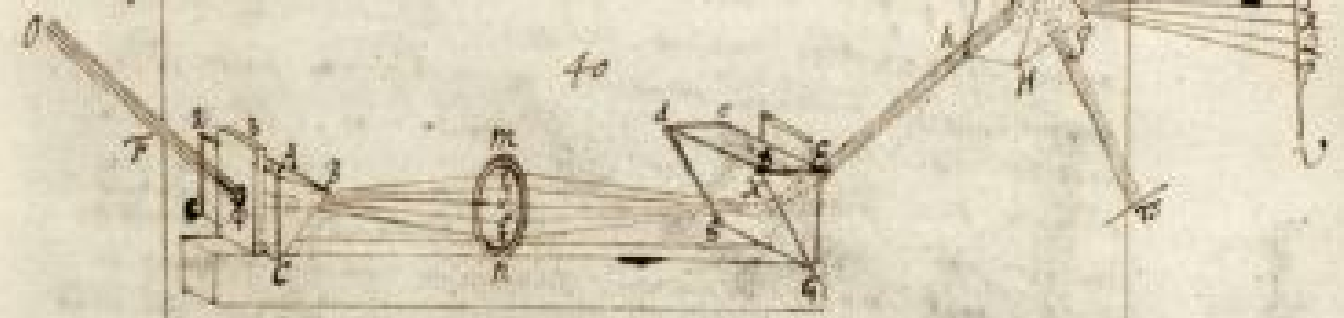
Surprisingly little research has investigated the social dimension of laughter in preschool children. This experiment studied children's responses to amusing video clips in the presence or absence of peers. The sample consisted of 9 boys and 11 girls aged 31-49 months (mean 39.8, SD 4.2) who watched three cartoons under three different conditions: individually, in pairs, or in groups of 6 or 8. The social viewing conditions showed significantly higher numbers of laughs and smiles than the individual viewing condition. On average children laughed eight times more in company as on their own, and smiled almost three times as much. No differences were found between pairs and groups, and no association was found between subjective funniness ratings and group size. This suggests that the presence of even a single social partner can change behaviour in response to humorous material. It supports the idea that laughter and smiles are primarily flexible social signals rather than reflexive responses to humour.

```
]# # necessary packages
install.packages(c('readr', 'reshape2', 'ez', 'effects', 'ggplot2', 'ggsignif', 'Rmisc', 'svglite', 'pwr',
, 'sjmisc'), repos='http://cran.us.r-project.org')
library(tidyverse)
library(readxl)
library(ggplot2)
library(ggsignif)
library(reshape2)
library(ez)
library(effects)
library(Rmisc)
```

[github.com/infantlab/SocialTV](https://github.com/infantlab/SocialTV)

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Plume 14

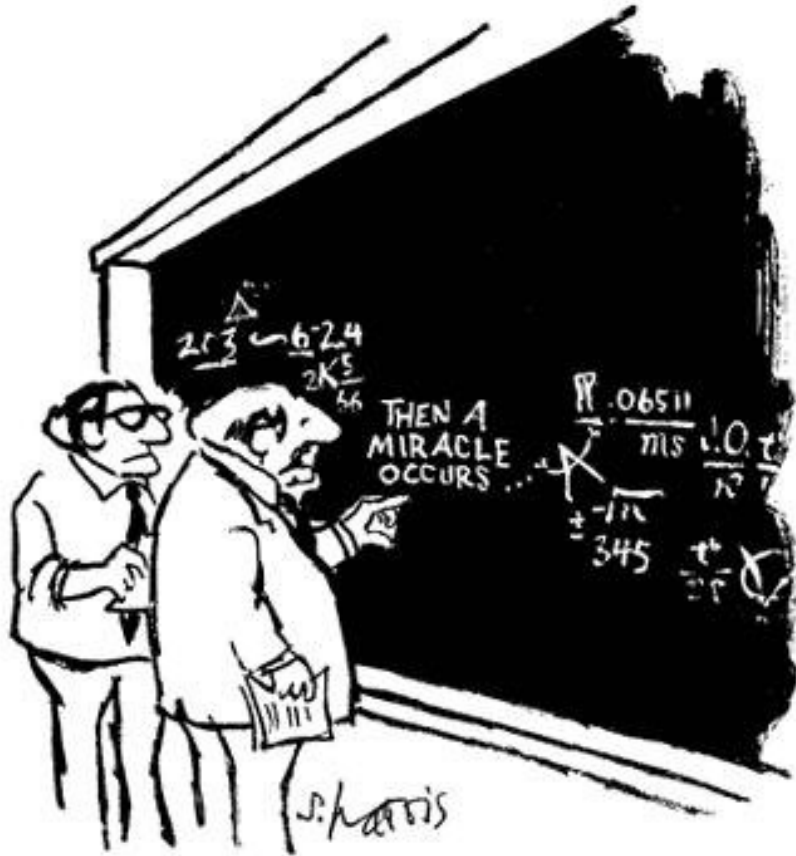


THE  
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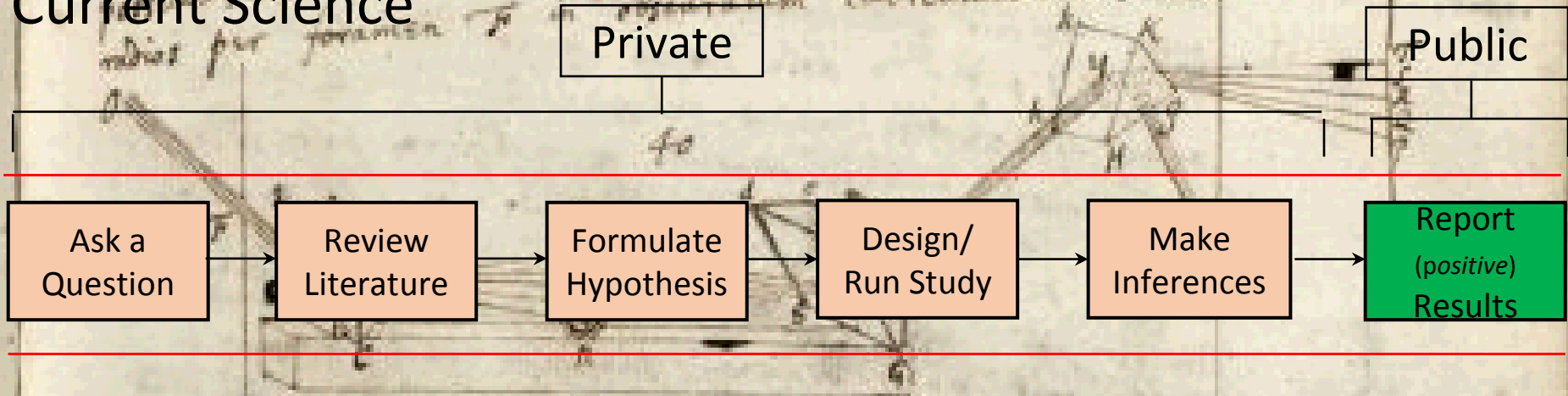
"I think you should be more explicit here in step two."



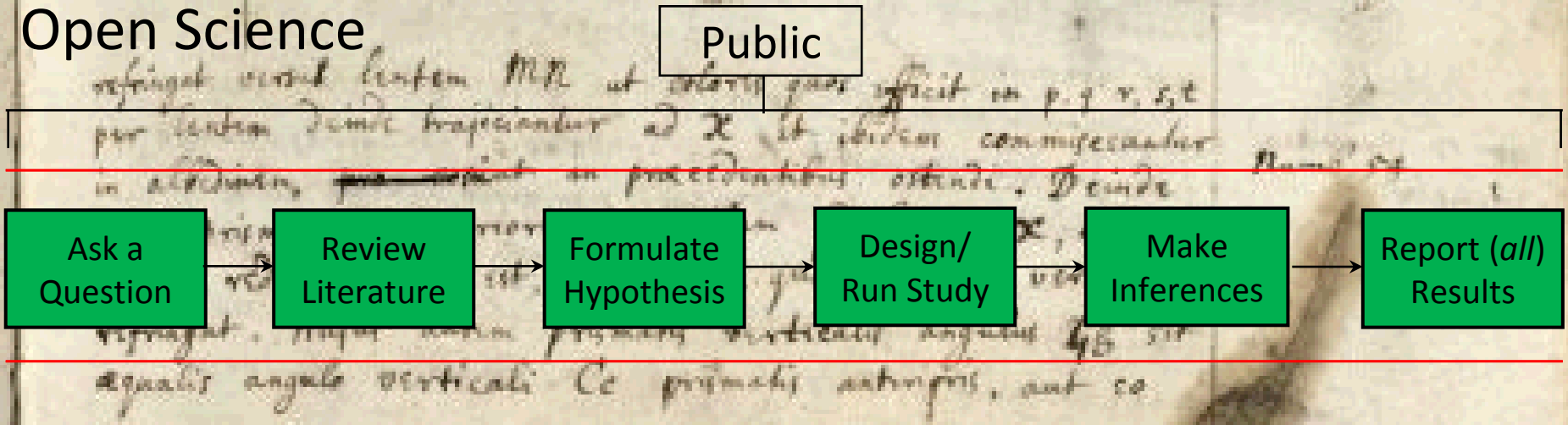
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CALM  
AND  
SHOW YOUR  
WORKING**

# The Research Process

## Current Science



## Open Science



# Badges! Badges! Badges!

**Preregistered** - a standard preregistration document published online before data collection begins

**Open data** - anonymised data + analysis scripts are made available online

**Open materials** - make available stimuli & code to run experiments

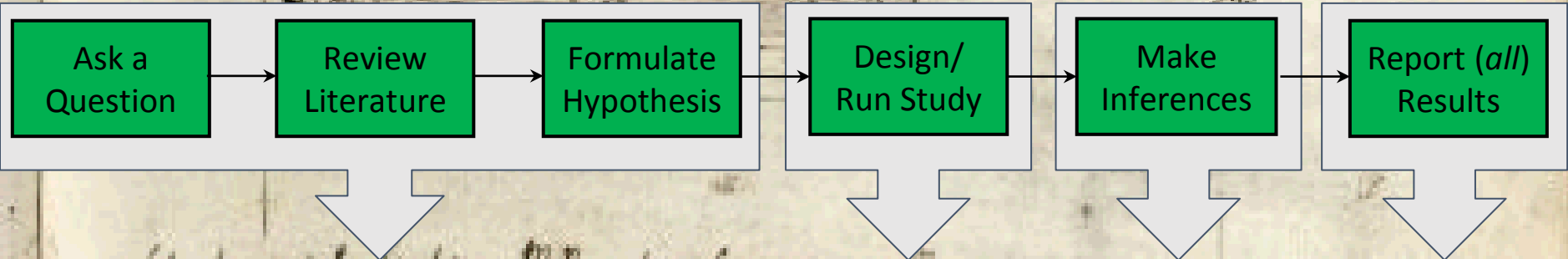


For each badge provide the URL, DOI, or other permanent path to relevant data/docs in a public, open access repository

<https://cos.io/our-services/open-science-badges/>

# Open Science

Public





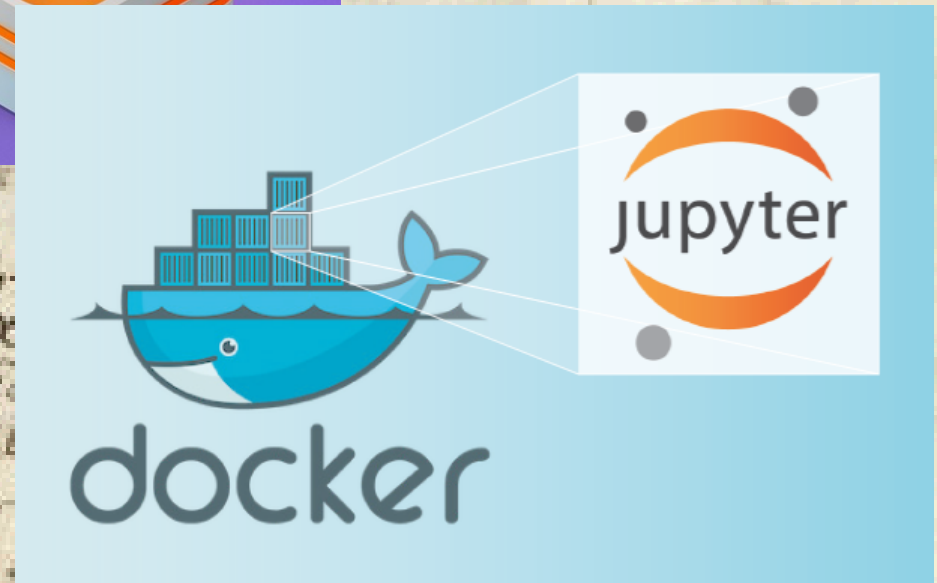
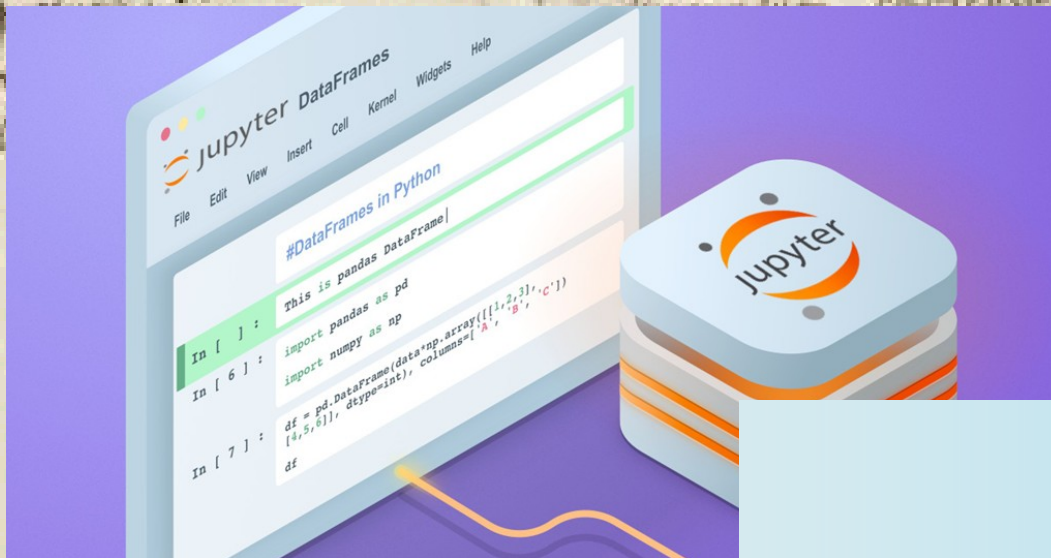
# Open data means data + analysis

**Open Data:** Authors complete two disclosure items for each Open Data badge application:

1. Provide the URL, DOI, or other permanent path for accessing the data in a public, open access repository.
2. Is there sufficient information for an independent researcher to reproduce the reported results? If no, explain.

<https://osf.io/tvyxz/wiki/2%20Awarding%20Badges/>

# Notebook mechanics



DataCamp Jupyter tutorial - [tiny.cc/j3j8zy](https://tiny.cc/j3j8zy)

# Notebook Demo

1. Navigate to [github.com/infantlab/NotebookDemos](https://github.com/infantlab/NotebookDemos)
2. Either
  - a. Download folder & run index.ipynb with your local Jupyter version

Or

- a. Click on the **launch binder** button

# Notebook Demo (behind the scenes)

Click on my **launch binder** button...

1. mybinder.org looks at contents of [github.com/infantlab/NotebookDemos](https://github.com/infantlab/NotebookDemos)
2. Compares it to Docker container cached on mybinder.
3. If nothing changed it quickly creates a fresh c
4. If it's new or changed it checks a file called `runtime.txt`

**r-2018-02-05**

1. Builds a whole new Docker container taking snapshot of software versions from 05 Feb 2018

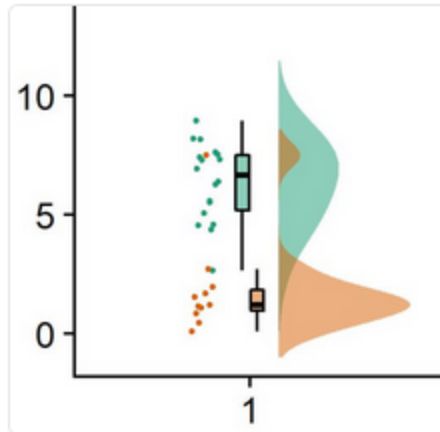


**neuroconscience**

@neuroconscience

Following

#Raincloudplots - Our v1.0 preprint with functions to make it rain in #Python, & #Matlab based tutorials! peerj.com/preprints/2713... - read more



2:00 PM - 24 Aug 2018

528 Retweets 1,297 Likes



Micah Allen, rogiev kievit, Kirstie Whitaker and 3 others

27 528 1.3K

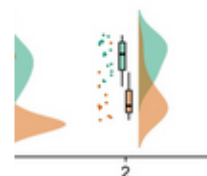


**rogiev kievit**

@rogievK

Following

The amount of useful feedback we got on this in a few days is astonishing. Not only would this be slower with traditional papers, it simply wouldn't happen at this scale/stage/speed.



**neuroconscience** @neuroconscience

#Raincloudplots - the preprint is here! Our v1.0 preprint includes a github repo with functions to make it rain in #R, #Python, & #Matlab + \*interactive\* web-based tutorials! peerj.com/preprints/2713... - read more in the thread below!

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6:24 PM - 29 Aug 2018

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8 41





**Joel Grus @ #SDSC18**

@joelgrus

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slides for my "I Don't Like Notebooks"  
#JupyterCon talk:



**I Don't Like Notebooks - Joel Grus - #JupyterCon 2...**

I Don't Like Notebooks hi, I'm Joel, and I don't like notebooks Joel Grus (@joelgrus) #JupyterCon 2018

[docs.google.com](https://docs.google.com)

5:55 PM - 24 Aug 2018 from [Manhattan, NY](#)

**678** Retweets **1,980** Likes



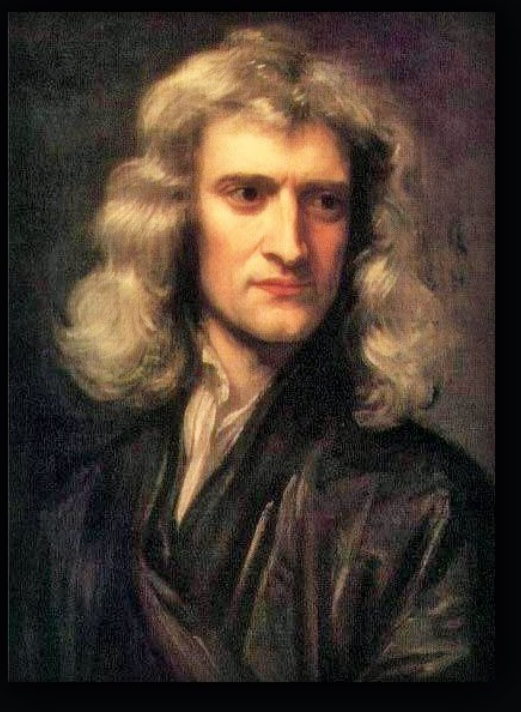
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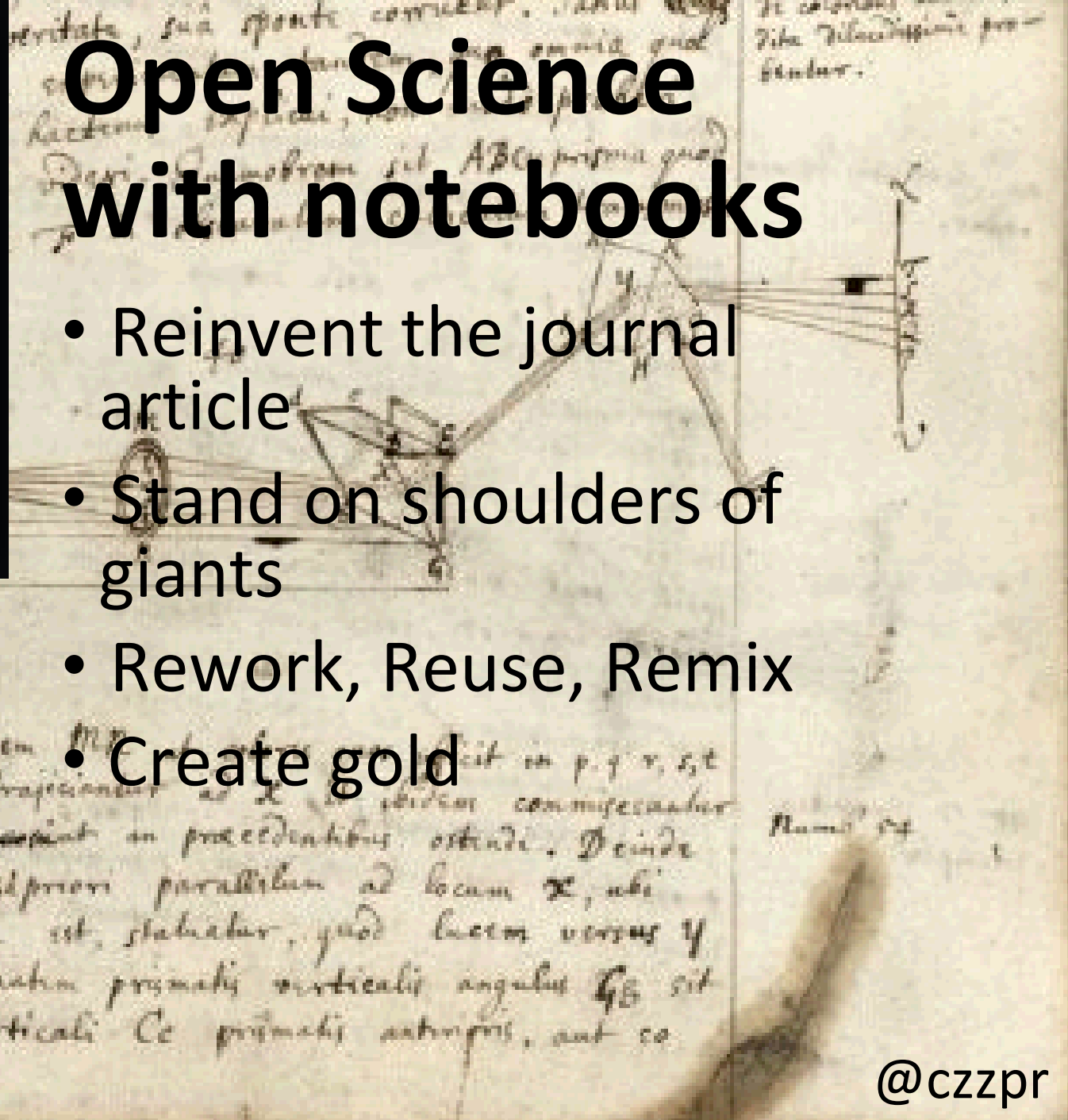


[twitter.com/joelgrus/status/1033035196428378113](https://twitter.com/joelgrus/status/1033035196428378113)



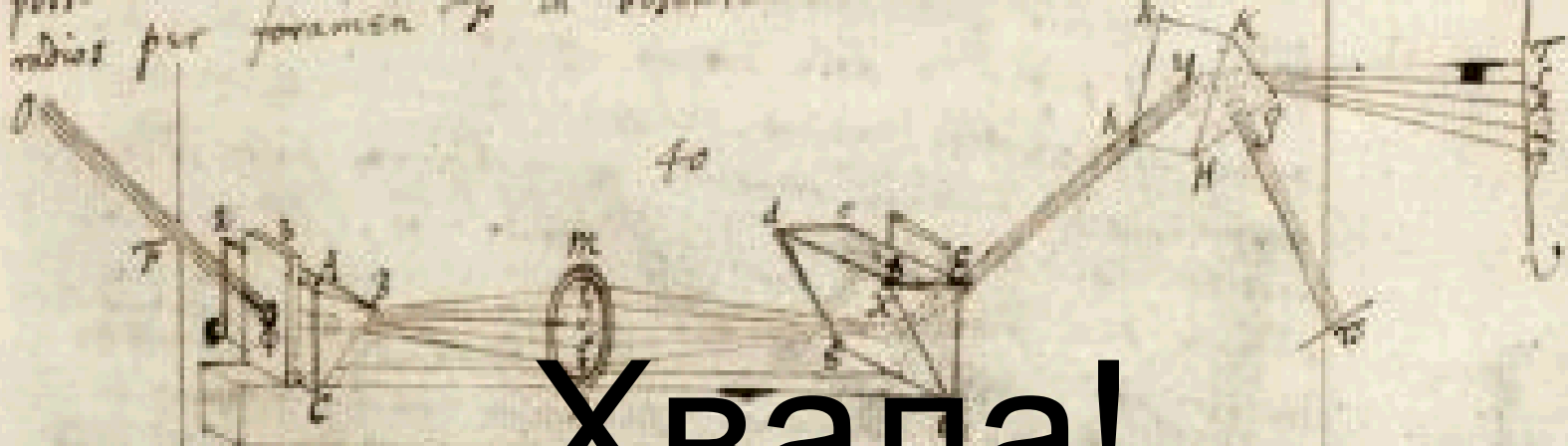
# Open Science with notebooks

- Reinvent the journal article
- Stand on shoulders of giants
- Rework, Reuse, Remix
- Create gold



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Хвала!

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