

Graphical Abstracts

The good, the bad and the ugly

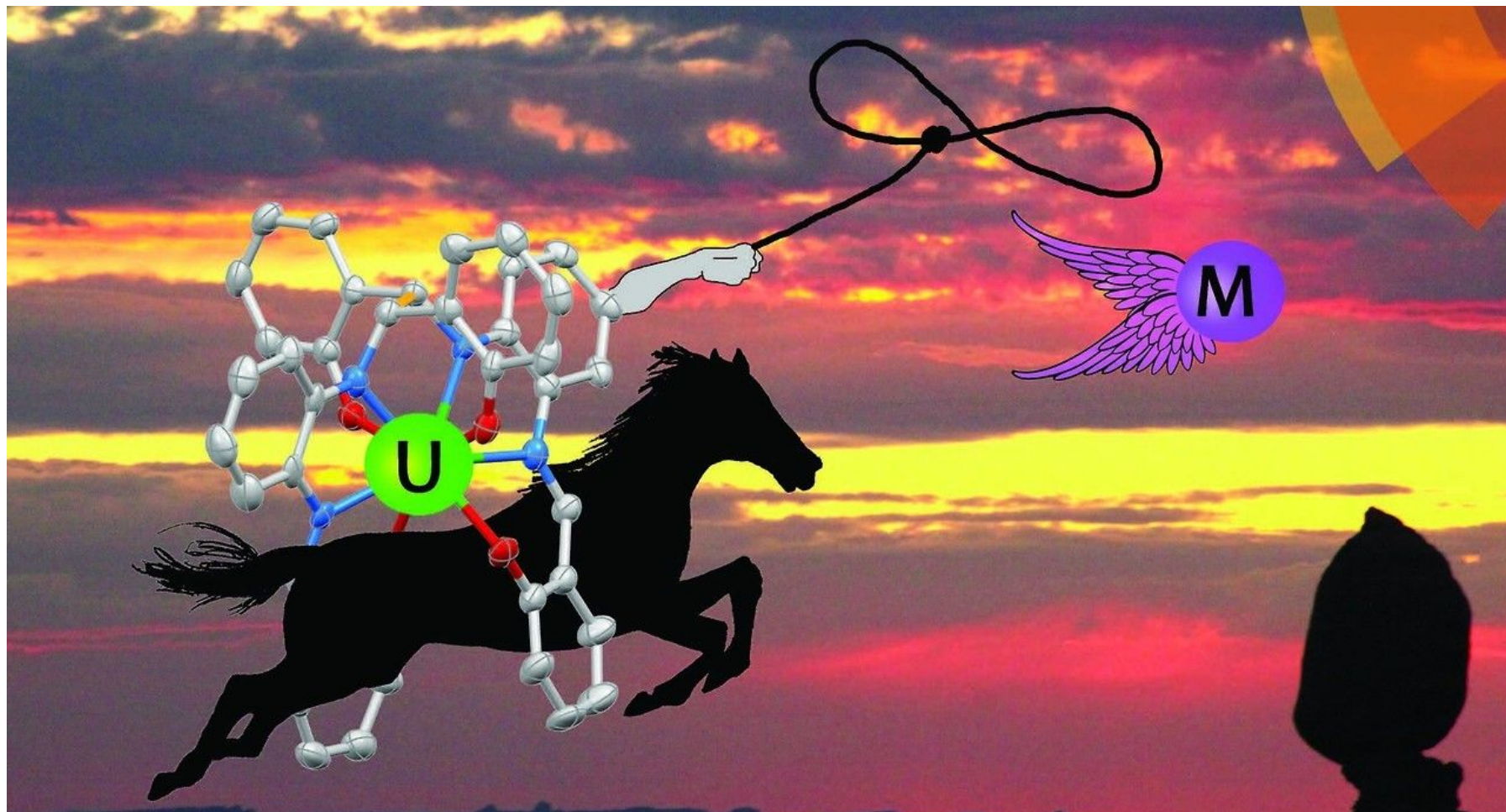
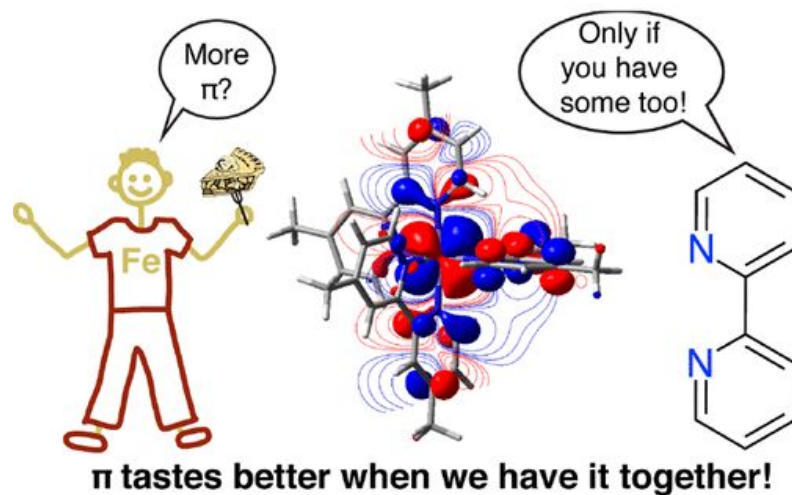
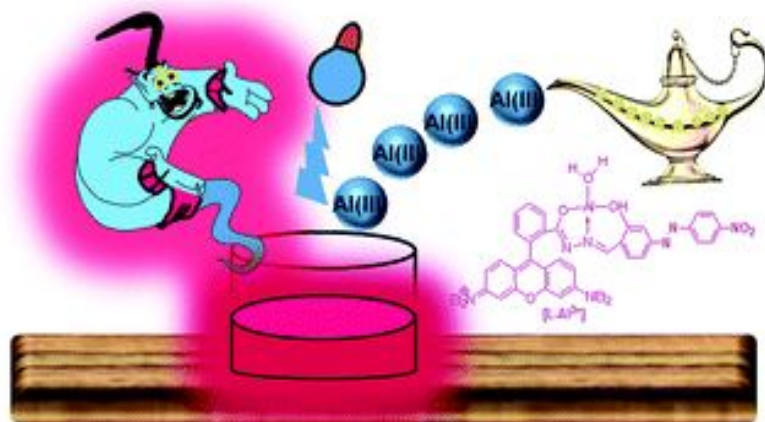
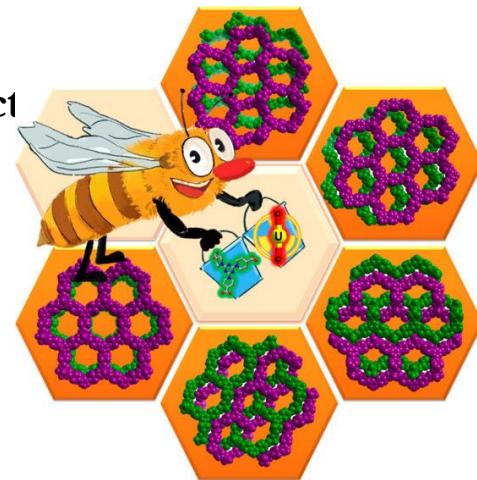


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π tastes better when we have it together!

Do you know how many papers there are?!

SCIENTIFIC PUBLISHING HAS BEEN ACCELERATING—A NEW PAPER IS NOW PUBLISHED ROUGHLY EVERY 20 SECONDS. LET'S IMAGINE A BIBLIOGRAPHY LISTING *EVERY* SCHOLARLY PAPER EVER WRITTEN. HOW LONG WOULD IT BE?

...1000 PAGES PER BOOK...

ALL OF HISTORY
VOLUME VII

...AND THEN WE START STACKING BOOKS...

1 2 3 4

BY 1920, THE LIST
WOULD BE GROWING BY
500 PAGES PER YEAR.

THE 1975 SECTION
WOULD FILL FOUR
HUGE VOLUMES.

TODAY, WE'RE UP TO 15
VOLUMES PER YEAR—
A PAGE EVERY
45 MINUTES.

...THIS IS WHAT THE FULL LIST WOULD LOOK LIKE:

ALL SCHOLARLY ARTICLES FROM BEFORE
1880 FIT IN JUST A FEW VOLUMES

EINSTEIN, A. "ON A THEOREM RELATIVE TO ELECTRODYNAMICS OF MOVING BODIES"
EINSTEIN, A. "ÜBER DIE VERHÄLTNISS EINE THEORIE DER ELEKTRODYNAMIK DER BEWEGTEN KÖRPER"
EINSTEIN, A. "ZUR ELEKTRODYNAMIK DER BEWEGTEN KÖRPER"

KUBBLE, E. EFFECTS OF
SHIFTS ON THE DISTRIBUTION
OF NEBULAE. PROCEEDINGS

SINCE THE ADVENT OF THE WEB, MUCH OF SCIENTIFIC PUBLISHING HAS BEEN MOVING TO OPEN ACCESS. ACCORDING TO SCIENCE-METRIX, OPEN ACCESS REACHED A "TIPPING POINT" AROUND 2011: MORE THAN 50% OF NEW RESEARCH IS NOW MADE AVAILABLE FREE ONLINE.

AS JOURNALS MOVE TO OPEN
ACCESS AND DIGITIZE THEIR ARCHIVES,
OLD PAPERS FROM EVERY PERIOD
MOVE UP HERE ...

...IN ADDITION TO THE FLOOD
OF NEW PAPERS BEING
PUBLISHED HERE DIRECTLY.

25% OF OPEN-ACCESS
PAPERS ARE FREELY
AVAILABLE ON PUBLICATION

THE REST BECOME FREE
WITHIN 12 MONTHS ON
JOURNAL WEBSITES
OR OTHER REPOSITORIES.

TRADITIONAL
PUBLICATION

1991: PAUL GINSBURG LAUNCHES
ARXIV FOR PHYSICS PREPRINTS

1987-89: FIRST ONLINE JOURNALS APPEAR

MOVED TO
OPEN ACCESS

RICHARD SCHLEGEL
UNDECIDABLE PROPO
AND THEMATICA AND

UPPER, R. A., AND G. C.
THE ORIGIN OF CHEMICAL
ELEMENTS. PHYSICAL

WATSON, J. D., AND

HARD SCHLEGEL
DECIDABLE PROPO
THEMATICA AND

1869: FIRST ISSUE OF NATURE

1880: SCIENCE FOUNDED

1999: NIH DIRECTOR PROPOSES AN
ARCHIVE OF FREE BIONED PAPERS

2000: PUBMED
CENTRAL DEBITE

2001: 30,000 SCIENTISTS CALL FOR BOYCOTT OF JOURNALS THAT DON'T ALLOW FREE ACCESS OR PURMED WITHIN 6 MONTHS

2003: PLoS BIOLOGY
LAUNCHED, CHARGES
\$1500 AUTHOR'S FEE

2006: U.K. MEDICAL RESEARCH COUNCIL
MANDATES FREE ACCESS WITHIN 6 MONTHS
PLOS RAISES TOP AUTHOR FEE TO \$2500
LAUNCHES PLOS ONE, WHICH REVIEWS
FOR SCIENTIFIC RIGOR, NOT IMPORTANCE

2008: NIH REQUIRES THAT PAPERS IT FUNDS BE MADE FREE WITHIN 12 MONTHS
HARVARD FACULTY AGREE TO POST PAPERS IN UNIVERSITY REPOSITORY

2010: PLoS BECOMES PROFITABLE
PLOS ONE BECOMES WORLD'S BIGGEST
SCIENTIFIC PUBLISHER BY VOLUME

2013: WHITE HOUSE ORDERS ALL SCIENCE AGENCIES TO PLAN TO MAKE PAPERS FREE WITHIN 12 MONTHS

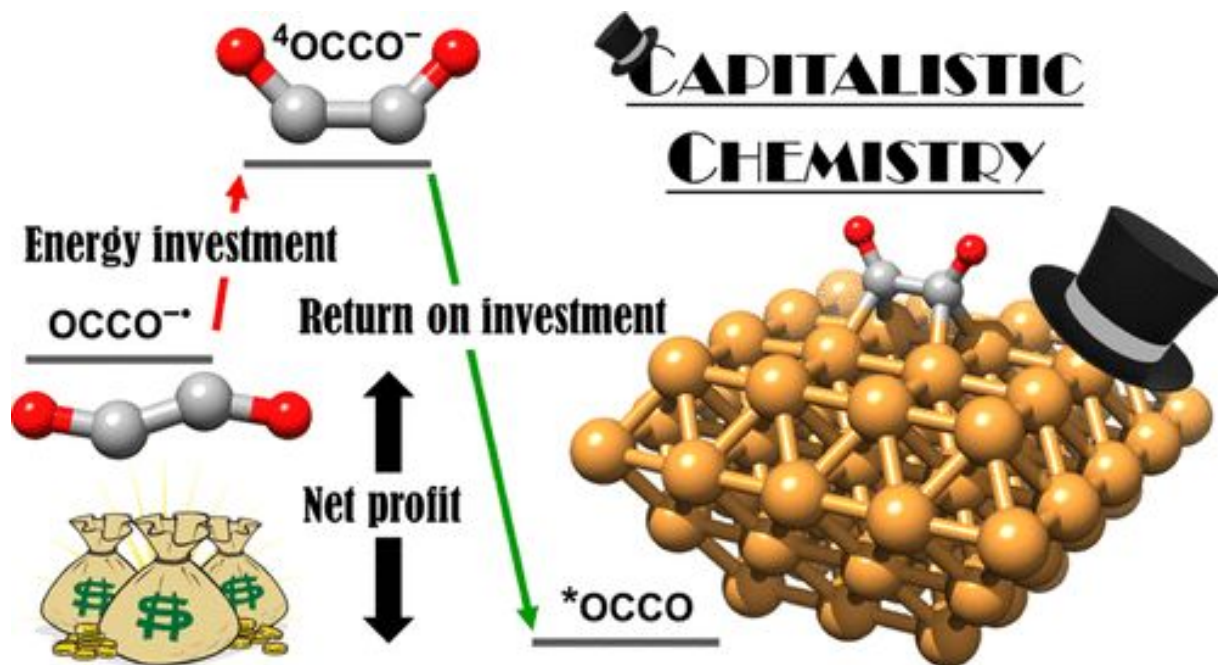
2014: EUROPEAN COMMISSION WILL REQUIRE
FREE ACCESS WITHIN 6-12 MONTHS

Purpose of a graphical abstract

Why should you spend time on graphical abstracts?

What do you think?

Get into groups of three and come up with a few ways you have found table-of-contents figures helpful.



Purpose of a graphical abstract

Why should you spend time on graphical abstracts?

To communicate the main idea of the paper

To grab researchers' attention

To provide eye candy

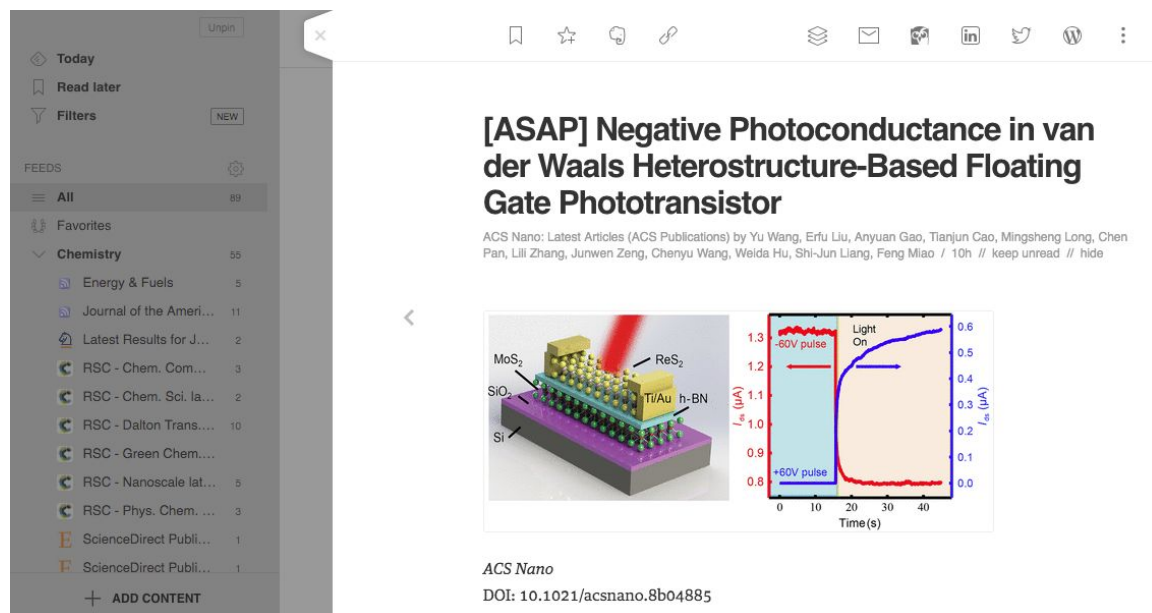
For press releases, social media etc.

For presentations you give

For your funding agencies

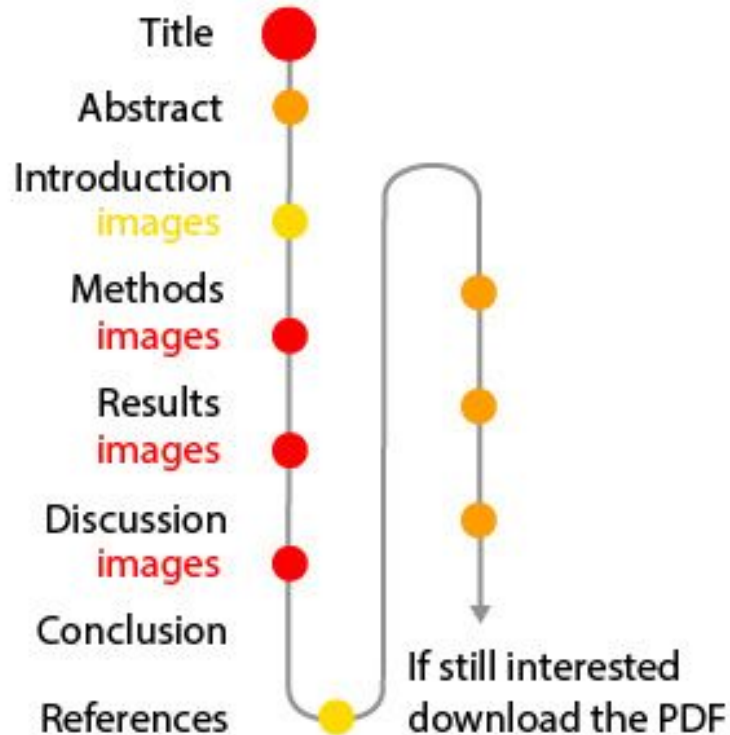
Not just the prettiest picture from the paper

“A Graphical Abstract should allow readers to quickly gain an understanding of the main take-home message of the paper and is intended to encourage browsing, promote interdisciplinary scholarship, and help readers identify more quickly which papers are most relevant to their research interests.” *ELSEVIER*



Purpose of a graphical abstract

How do people scan through research papers?



- Main focus
- Detailed reading
- Focused scanning
- Quick scanning



2016 www.Seyens.com, Creative commons license
(from presentation by Lucia Franco, ELSEVIER 2010)

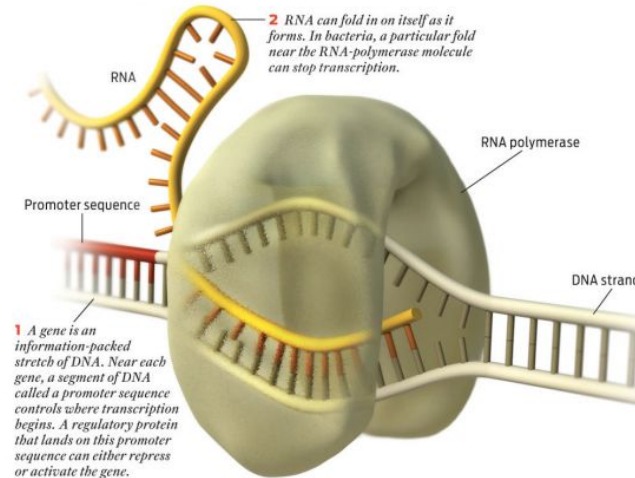
Purpose of a graphical abstract

Technical or abstract?

“One of the main aims of a graphical abstract is to distil the take-home message of an article into an image that is not too cluttered, somewhat eye-catching, and relatively simple to interpret — graphical abstracts should not be abstract art... It could be argued that any graphical abstract that makes us sit up and take notice has served its purpose, but that's only really the case if it makes us want to read the paper it is advertising.”

Technical - informative

Transcription: DNA is converted into RNA. To accomplish this, an RNA-polymerase molecule latches onto a DNA strand, reads its genetic sequence, and assembles a complementary RNA molecule.



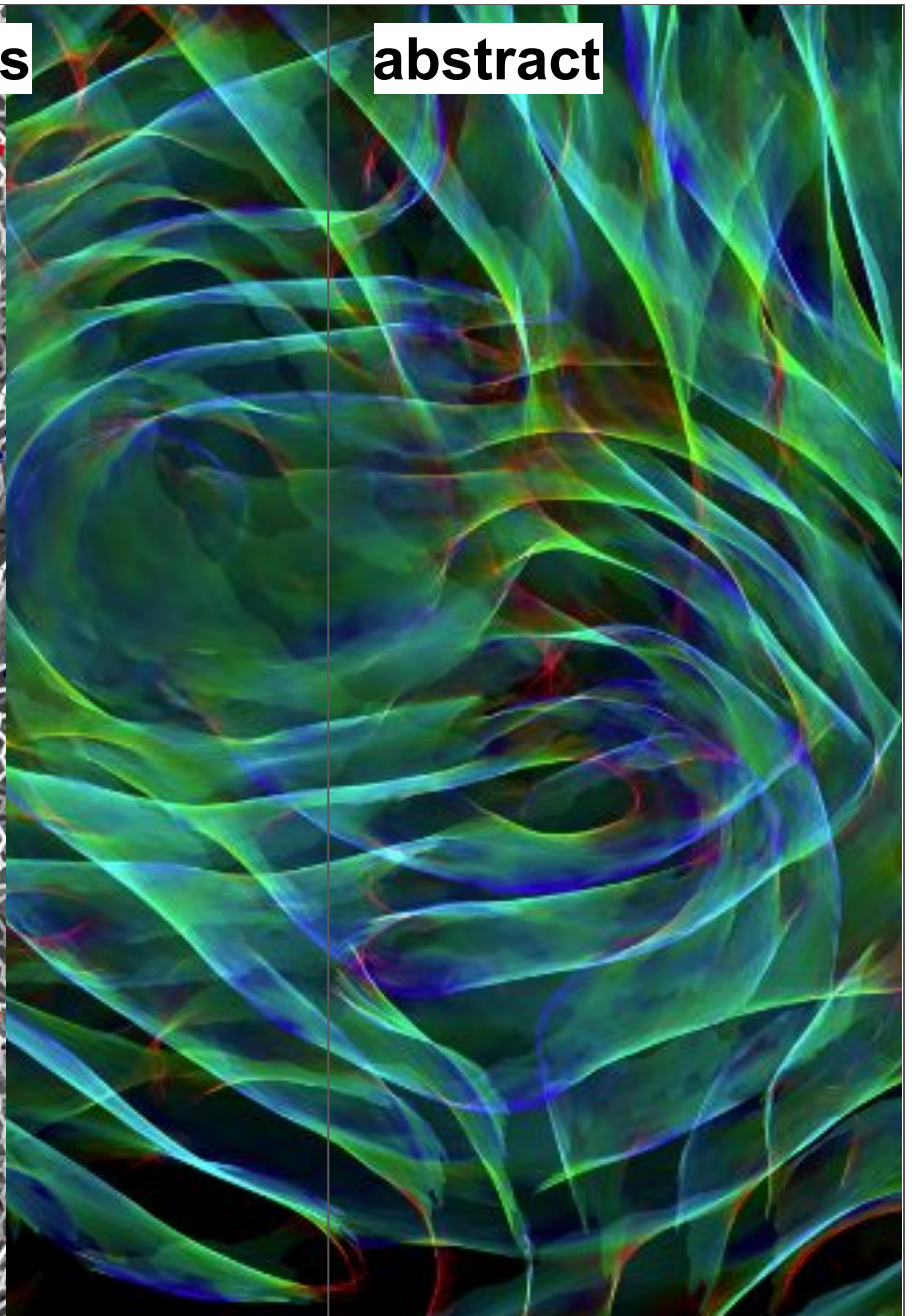
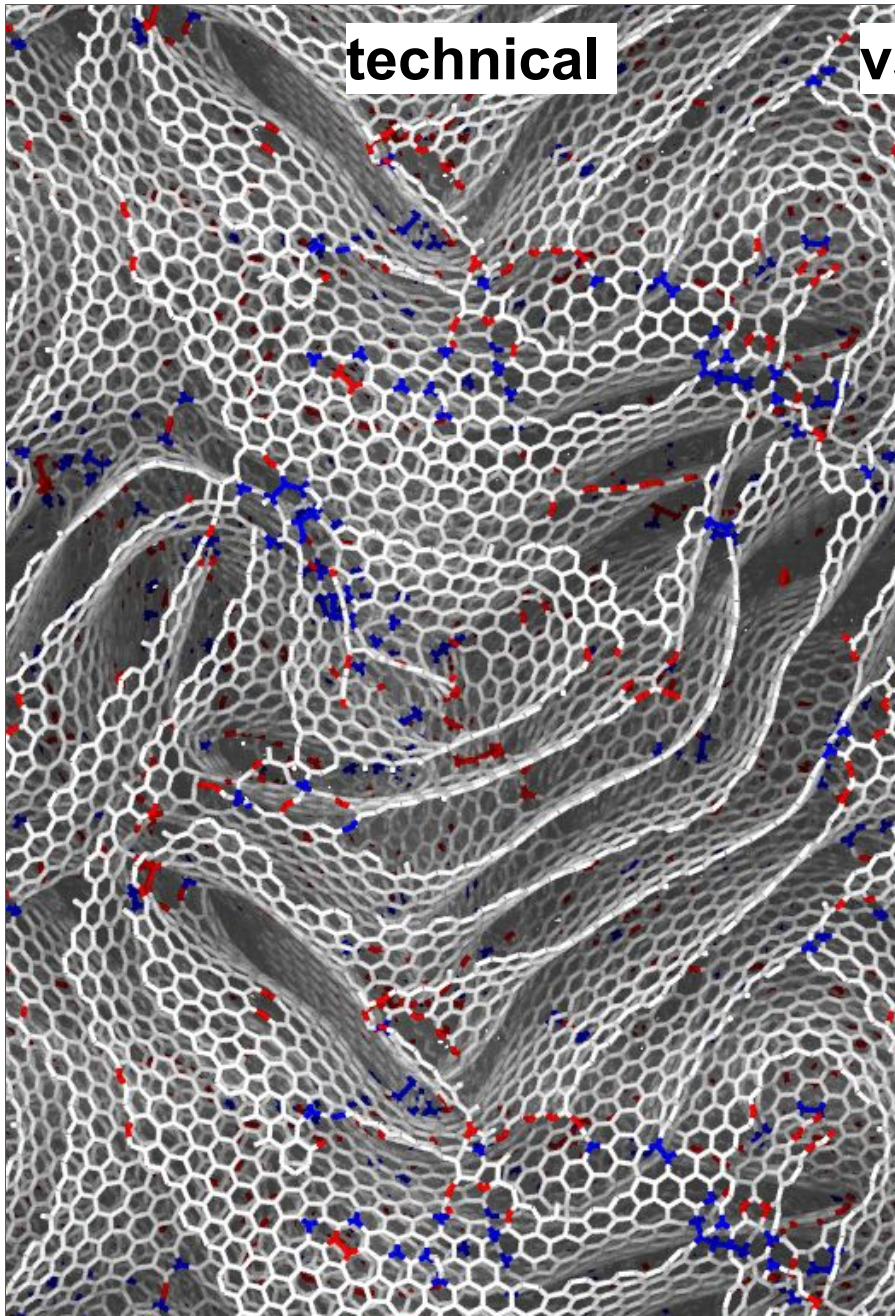
Abstract - eye candy



technical

vs

abstract



Who is your audience?

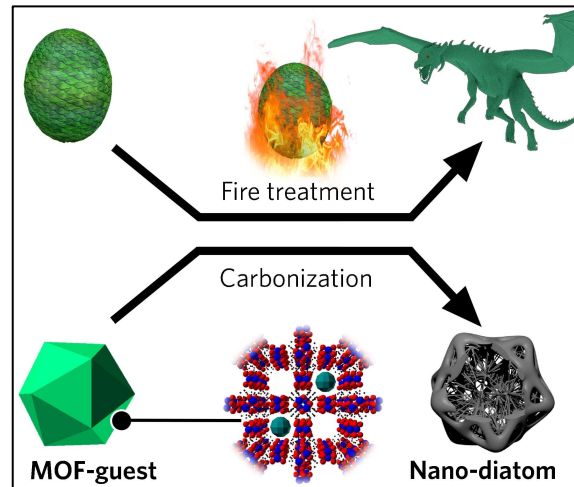
Who do you want to communicate your research to?

Curse of the expert.

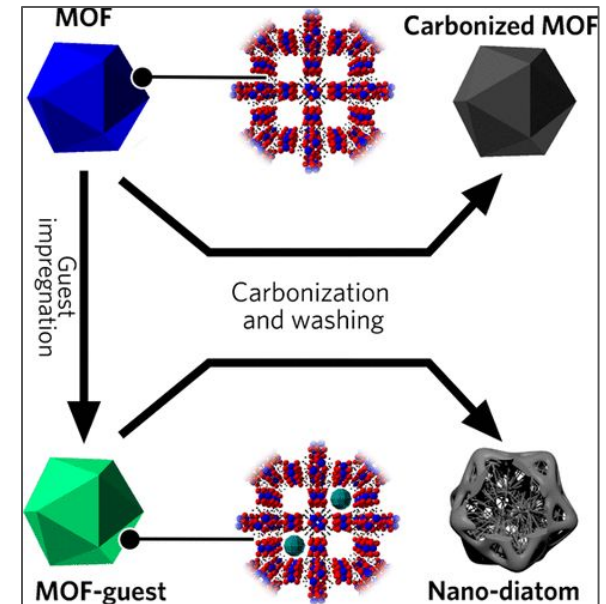
Try to avoid graphs that are difficult for the non-expert to understand.

Think about explaining it to someone intelligent but in a different field.

Public



Academics



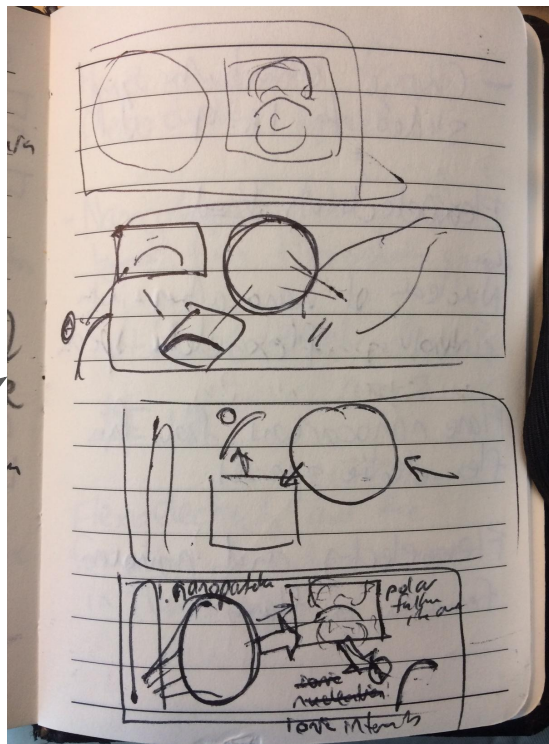
What is the story?

How can you graphically tell a story?

Decide what one message
you want to tell from
your paper

Trade vague with
concrete analogies

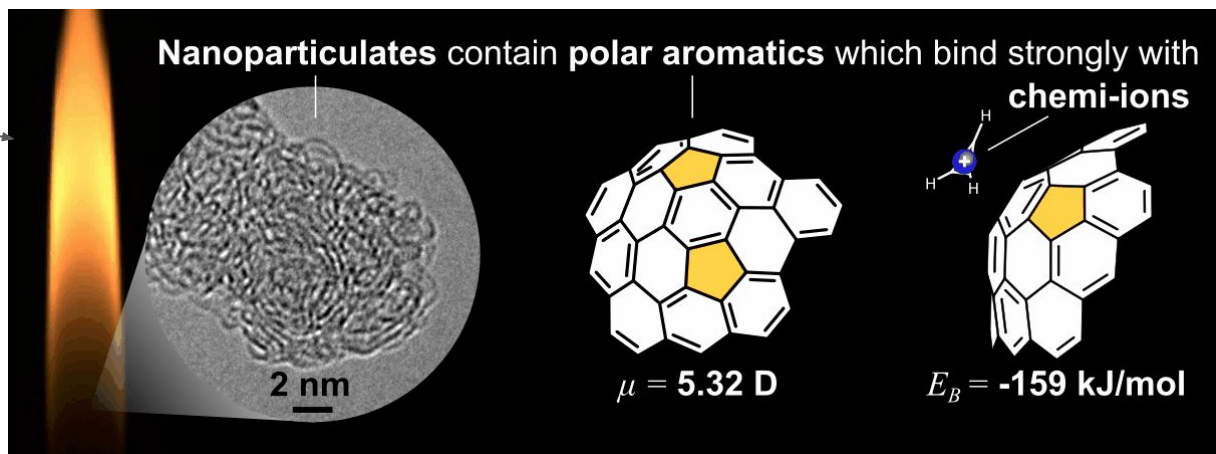
Sketch out ideas with
pencil and paper



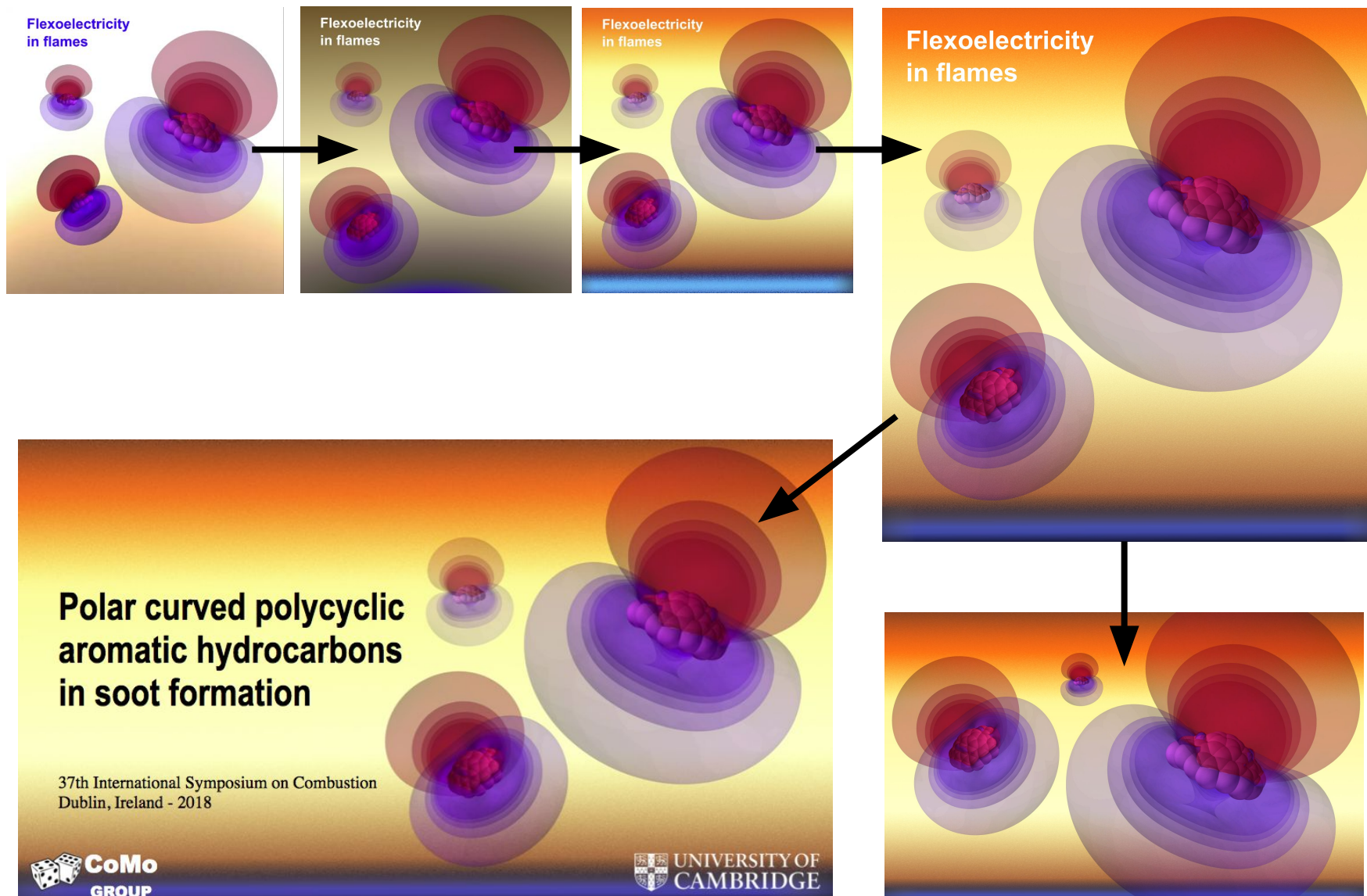
Try out the ideas on the
computer

Simplify by removing or
grouping

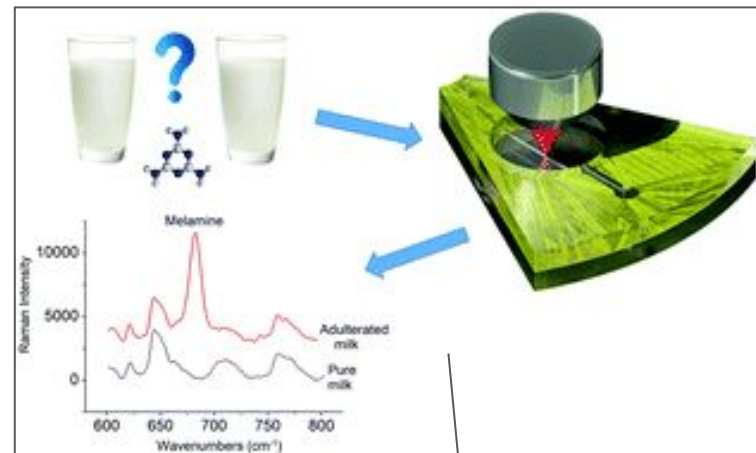
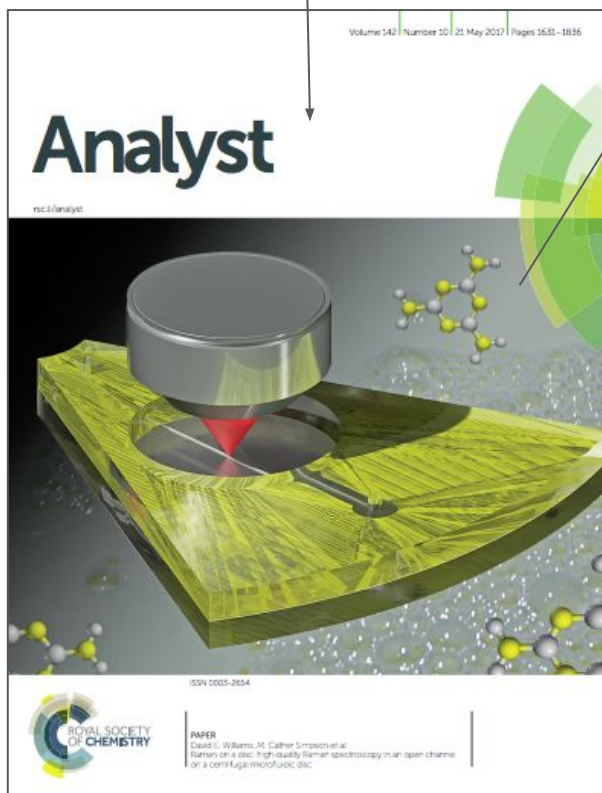
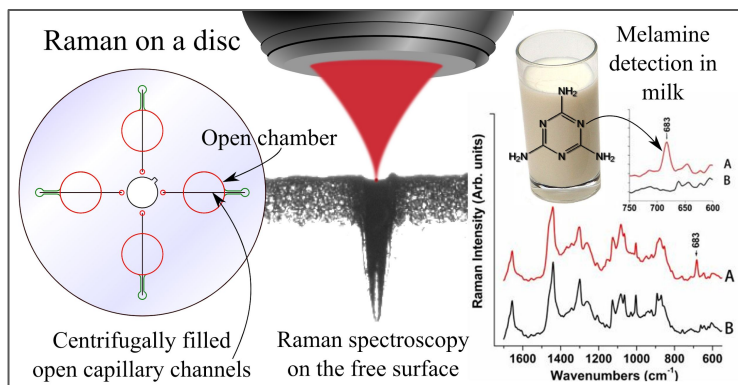
Remove anything that is
not central to the message



Cover art to TOC



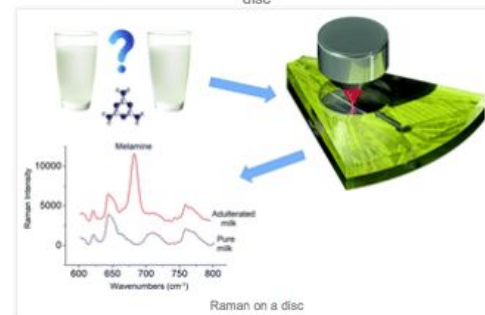
Cover art to TOC



Tuesday, 14 February 2017

Chemical analysis of milk on a compact disc

Raman on a disc: high-quality Raman spectroscopy in an open channel on a centrifugal microfluidic disc

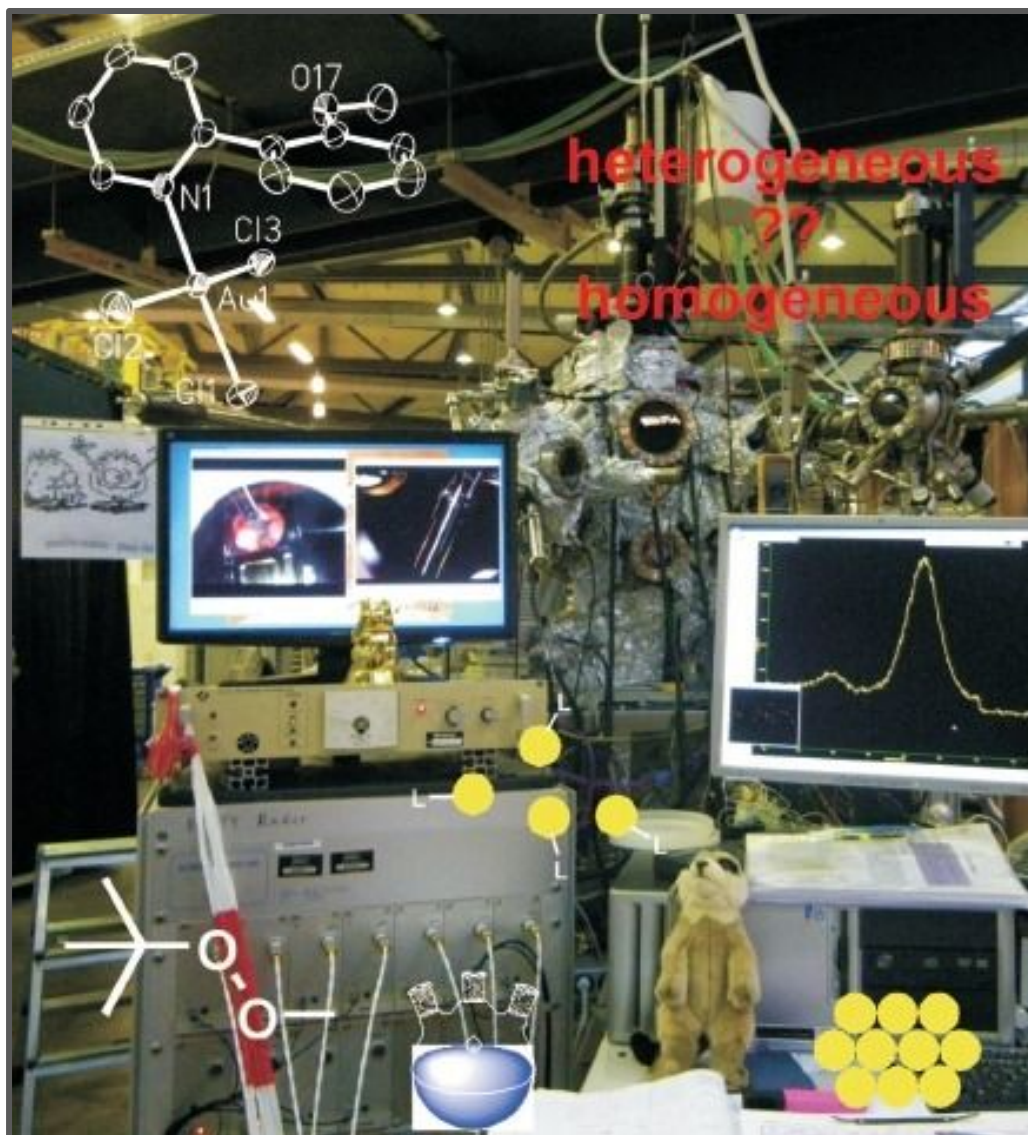


We know how much food colouring has been added to a recipe by the intensity of the colour. Food colouring is made of dye molecules which absorb certain colours of light and scatter others. Measuring the concentration of food colouring is easy - all that is needed is a light emitting diode (LED) and a light sensor (link to laser cut detector). But how do we determine the concentration of molecules that are not coloured? One method that has recently gained a lot of attention is Raman spectroscopy. Put simply, a laser is used to excite the molecules, then a camera picks up a characteristic fingerprint derived from the way the molecules jiggle/vibrate due to thermal motion.

Michel Nieuwoudt and others in the [Photon Factory](#) have found that Raman spectroscopy can allow for the determination of all of the important components in milk such as protein, fat and health indicators. In a [previous post](#) I wrote about measuring the contaminant melamine in milk using gold coated Blu-ray discs which amplified the weak Raman signal to something detectable. This month we published a follow-up work that aimed to integrate milk analysis into a device that could be used in a dairy shed.



Style advice - Keep it simple



Let's talk details

Little things make the difference

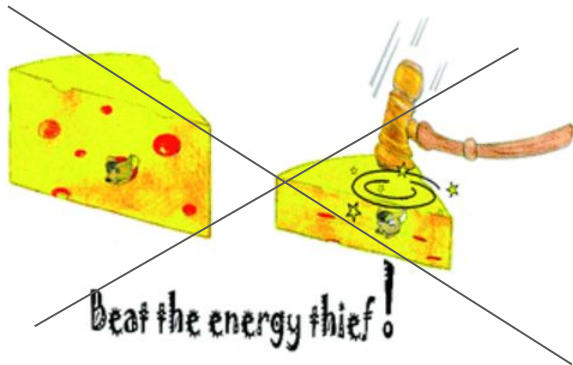
Vectors or raster

Raster needs to be >300 dpi

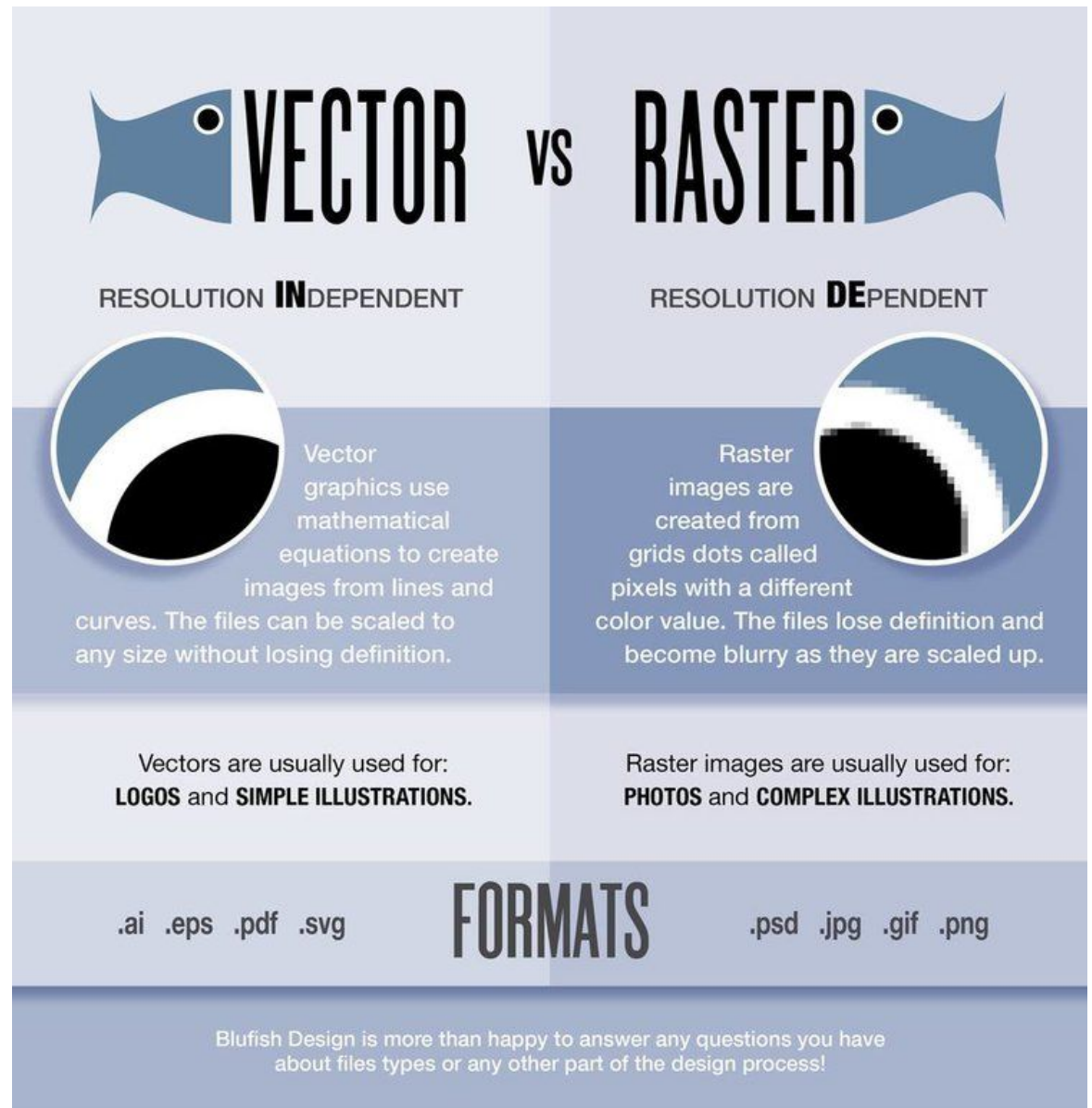
Fonts

Keep it simple

Arial, Times, Courier



Check the size



Let's talk details

Think about the aspect ratio and how it will be viewed

Multifunctional Theranostic Nanoparticles Derived from Fruit-Extracted Anthocyanins with Dynamic Disassembly and Elimination Abilities

Caina Xu, Yanbing Wang, Haiyang Yu, Huayu Tian, and Xuesi Chen

Publication Date (Web): August 8, 2018 (Article)

DOI: 10.1021/acsnano.8b03525



Figure 1 of 8

Abstract | Supporting

0 of 166

ACS ActiveView

Hi-Res Print, Annotate, Reference, New

PDF[4878K]

PDF w/ Links[6]

Full Text HTML

Add to ACS ChemWorx

Colloidal Bismuth Nanocrystals as a Model Anode Material for Rechargeable Mg-Ion Batteries: Atomistic and Mesoscale Insights

Kostiantyn V. Kravchyk, Laura Piveteau, Riccarda Caputo, Meng He, Nicholas P. Stadie, Maryna I. Bodnarchuk, Rainer T. Lechner, and Maksym V. Kovalenko

Publication Date (Web): August 7, 2018 (Article)

DOI: 10.1021/acsnano.8b03572

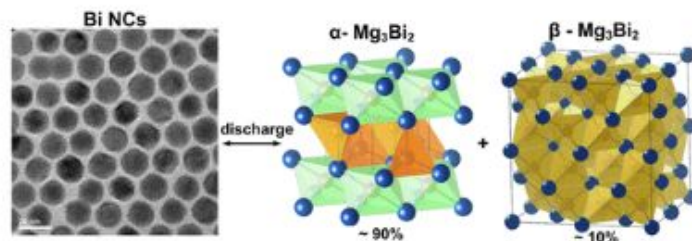


Figure 1 of 5

Abstract | Supporting Info

ACS ActiveView PDF

Hi-Res Print, Annotate, Reference QuickView

PDF[2721K]

PDF w/ Links[559K]

Full Text HTML

Add to ACS ChemWorx

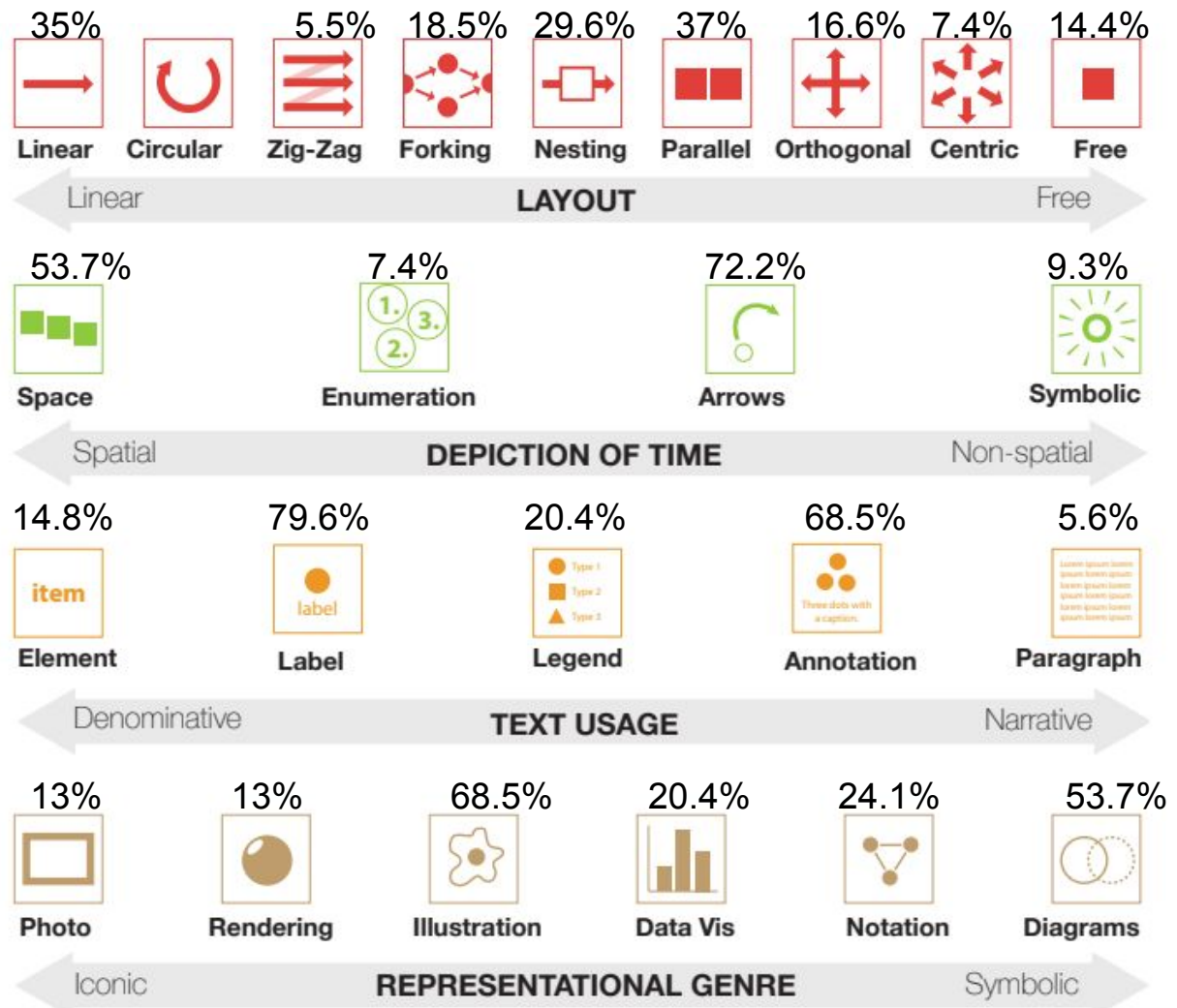
Let's talk details

Graphical components and layouts

Considered 54 graphical abstracts

Choose a layout that allows you to tell the main message effectively

Alignment is crucial for each layout

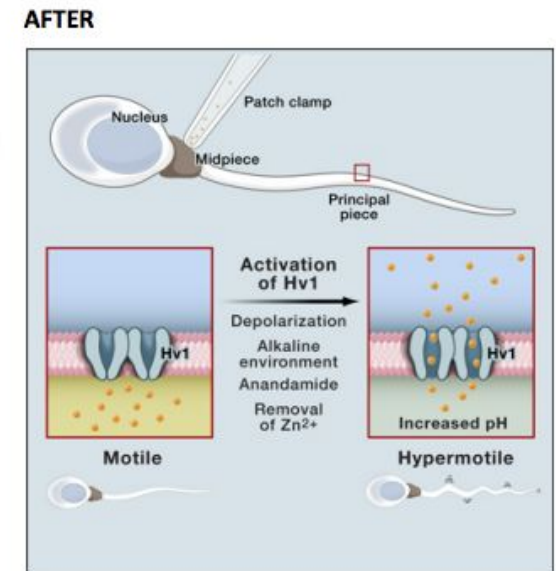
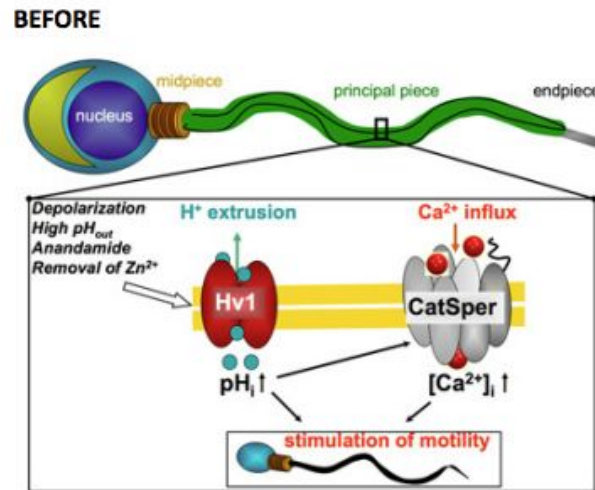


Let's talk details

Colours

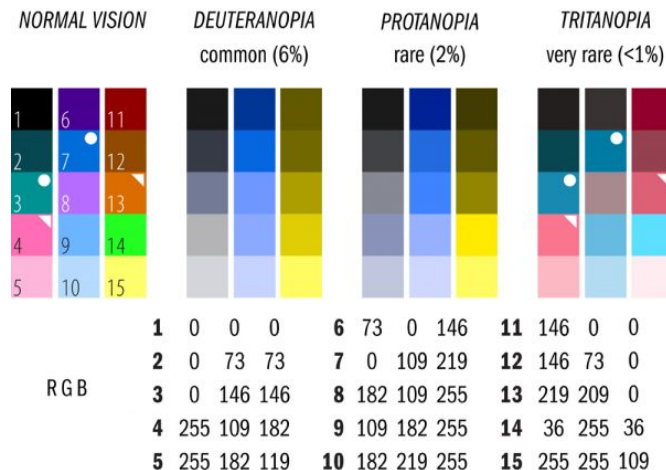
Less is more when it comes to colour.

[Make use of a colour palette from online](#)



Think about colour blindness

15-COLOR PALETTE FOR COLOR BLINDNESS



Software

Software to make graphical abstracts

Powerpoint

Pros

- Low barrier to entry
- Coauthors can edit
- Transfer to presentations

Cons

- Alignment can be difficult
- Limited illustration
- Resolution can be low

Inkscape

Pros

- Vector drawing
- Can edit pdfs and figures directly
- Free and open
- Rendering at different resolutions

Cons

- Hard for people to collaborate
- Learning curve
- Sometimes unstable (save a lot)

Illustrator - vector

Blender - 3D graphics

POV-ray - 3D graphics

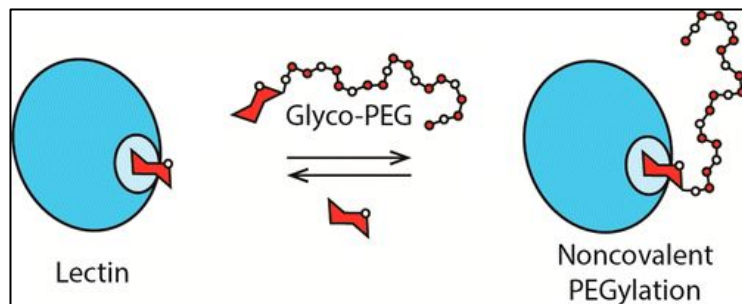
VMD - molecules

Avogadro - molecules

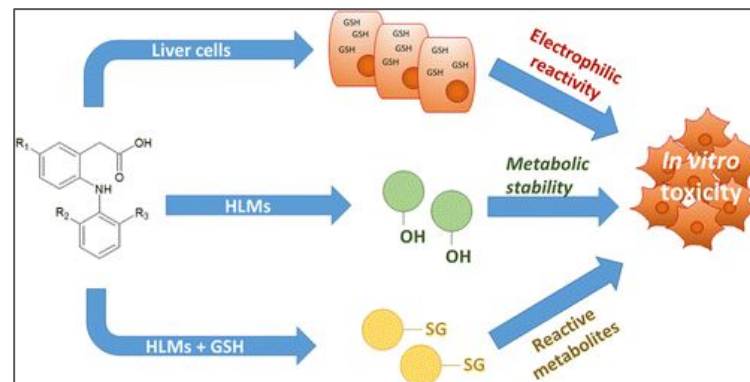
Marvinsketch - molecules

Chemdraw - molecules

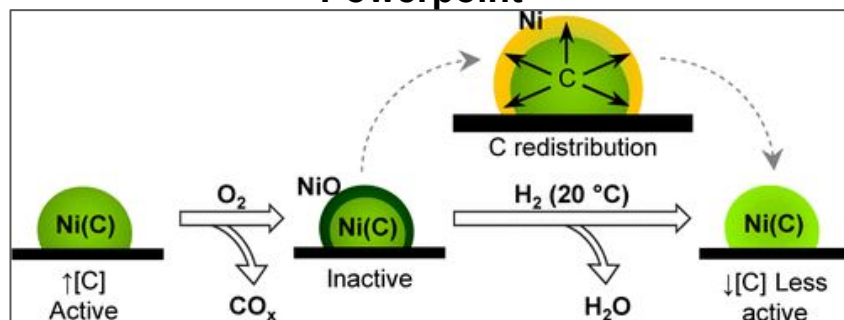
MS Paint



Corel draw



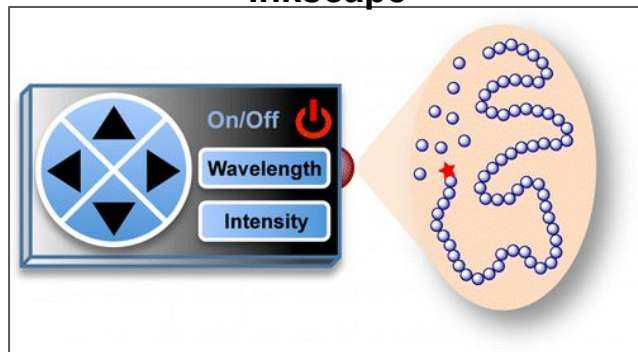
Powerpoint



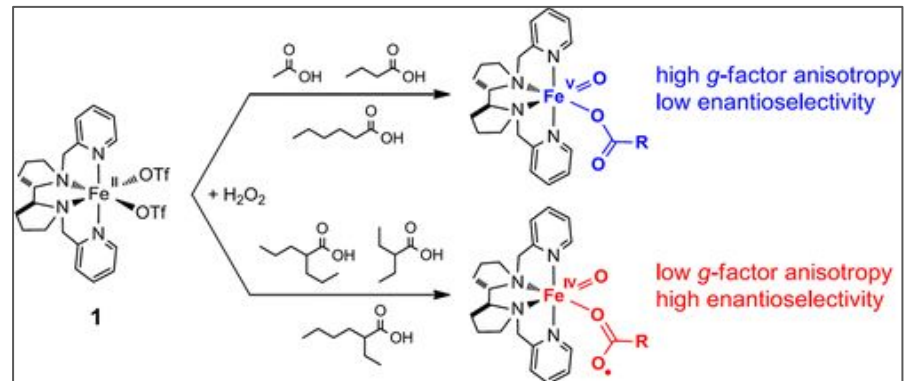
Adobe Illustrator



Inkscape



Chemdraw



Style advice

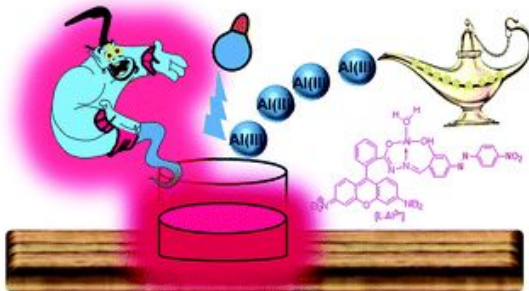
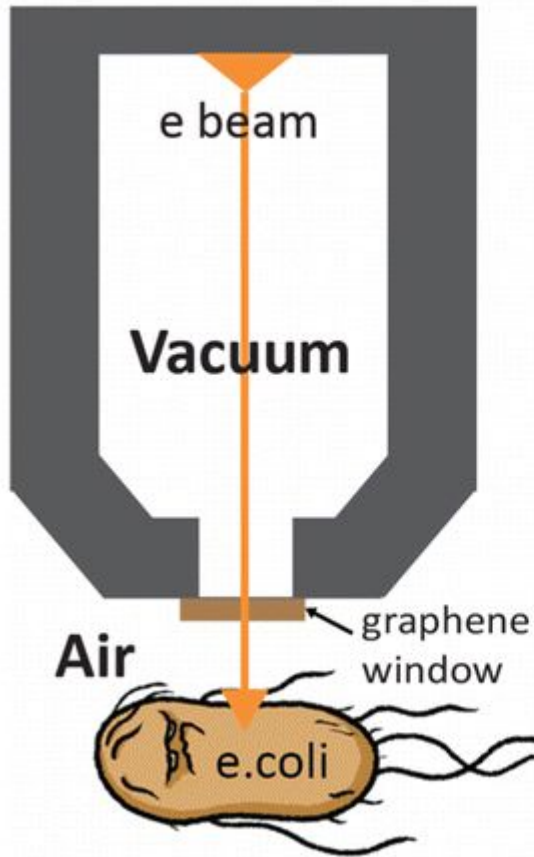
Ruined by clip art

Take pictures of the
experimental
setup/sample as you go

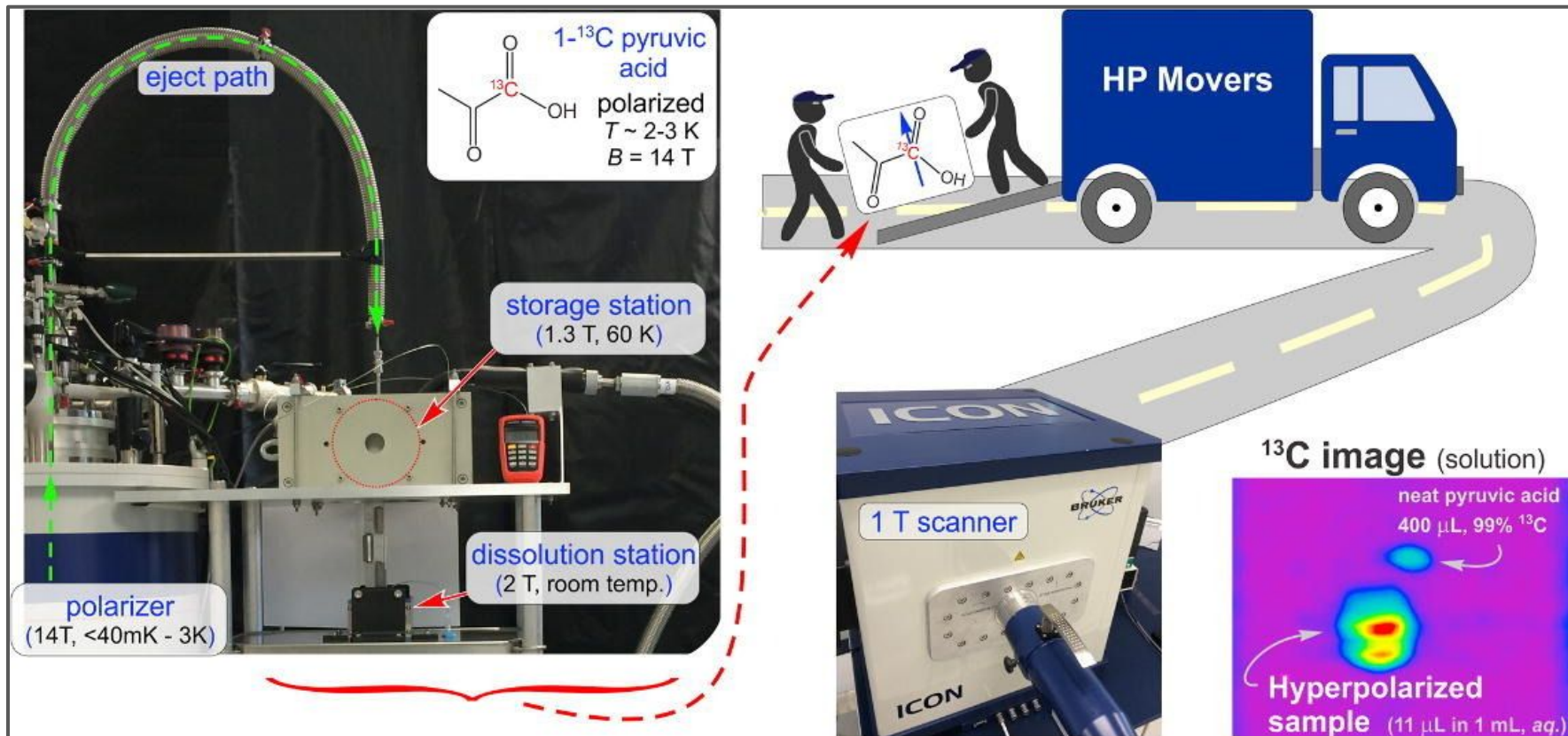
Make your own
schematics

Use pictures from Google
images (check rights)

Type 'free stock photos'
into Google search



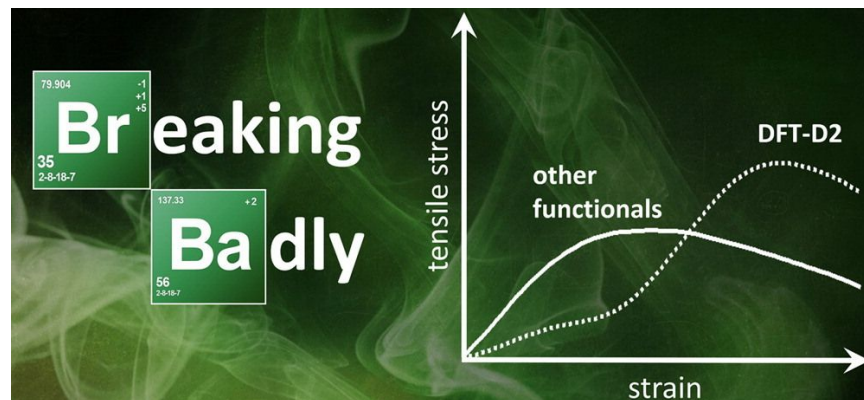
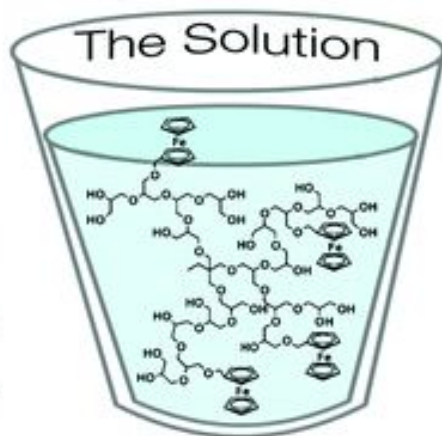
Style advice - Keep it simple



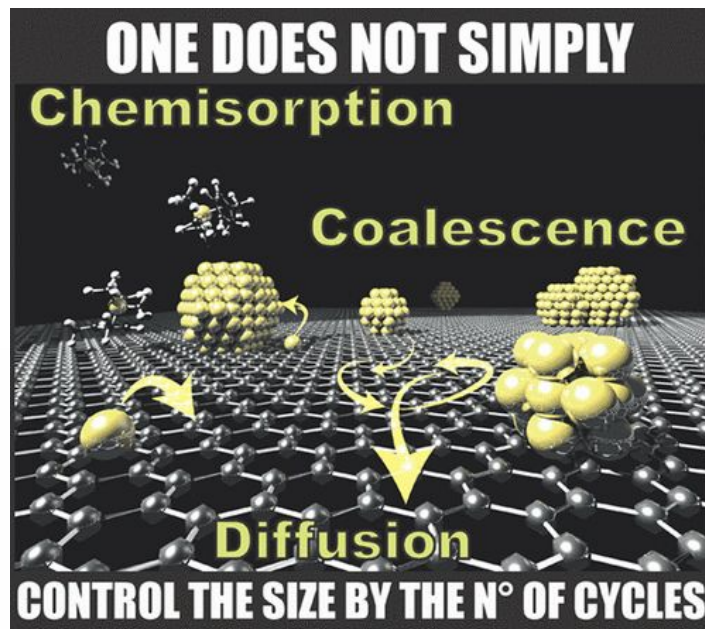
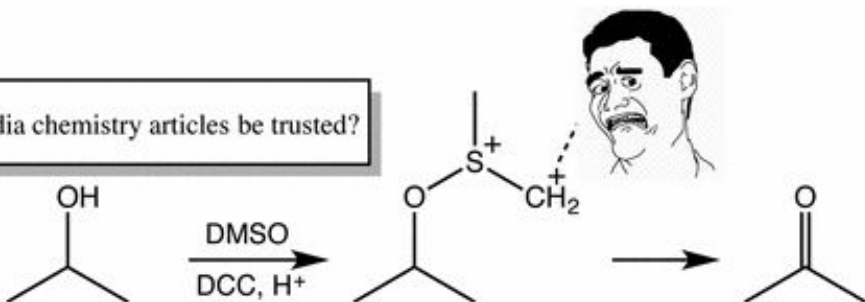
Limit yourself to four elements

Style advice - Avoid the gimmick

NOW KISS!

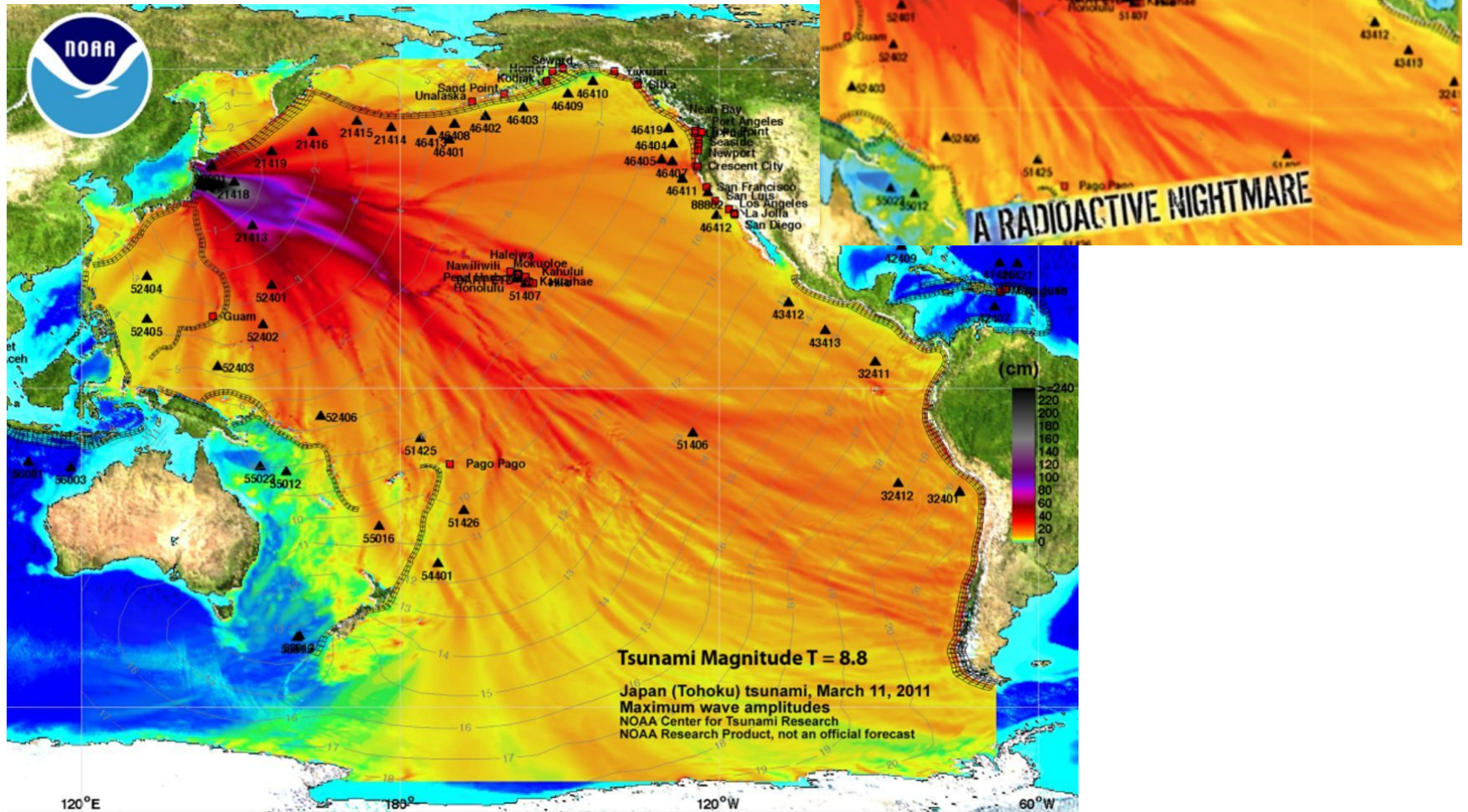


Can Wikipedia chemistry articles be trusted?



Style advice - Think about misinterpretation

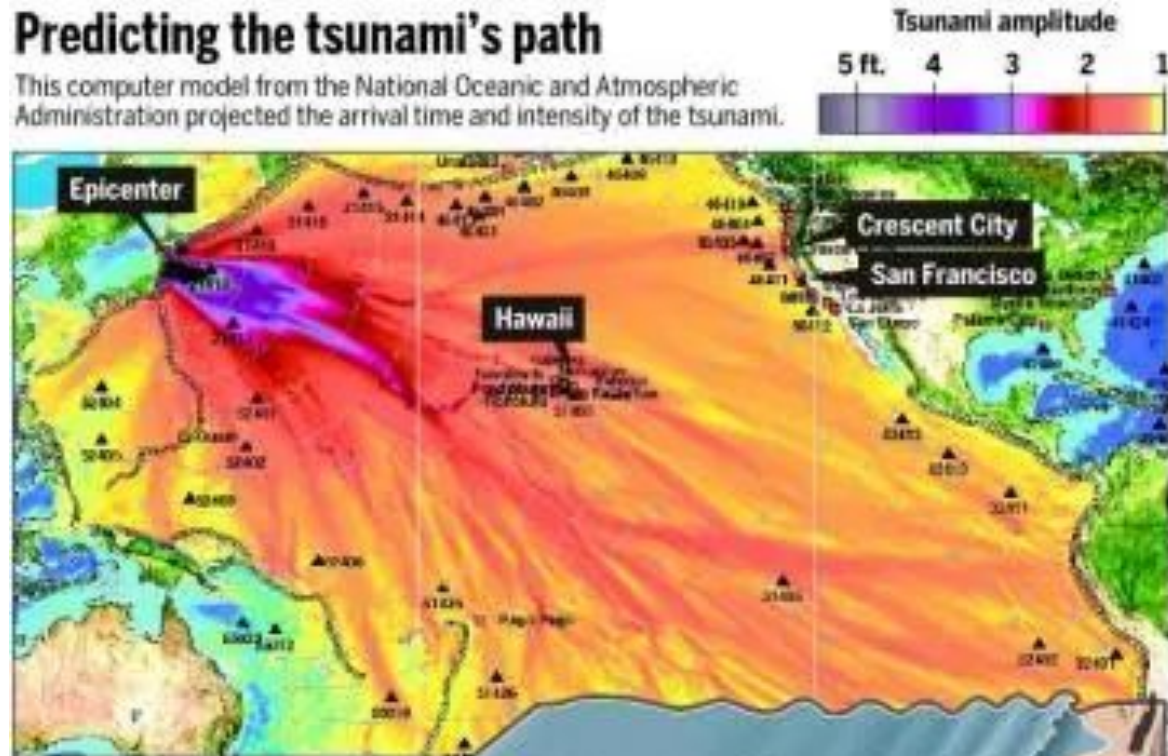
Ask someone from outside your group about the image



Style advice - Think about misinterpretation

Predicting the tsunami's path

This computer model from the National Oceanic and Atmospheric Administration projected the arrival time and intensity of the tsunami.



How a tsunami begins

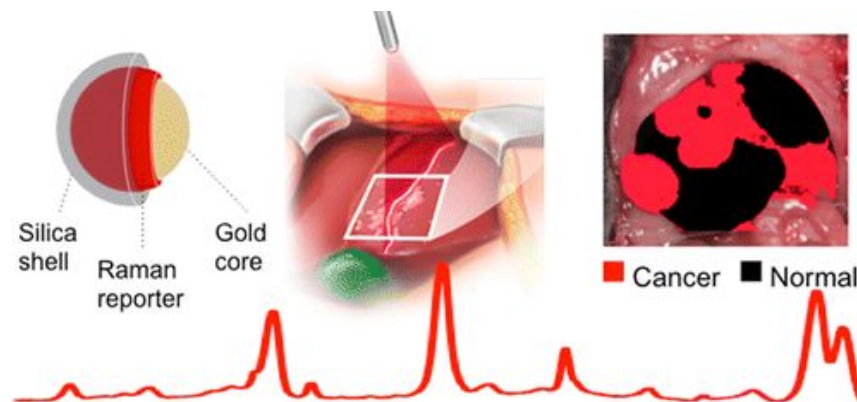
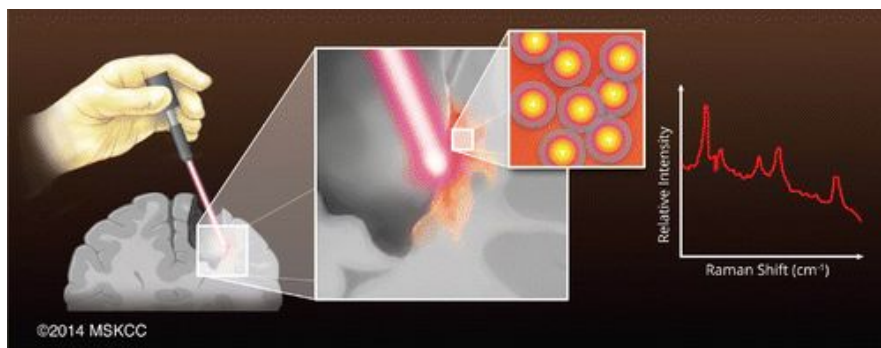
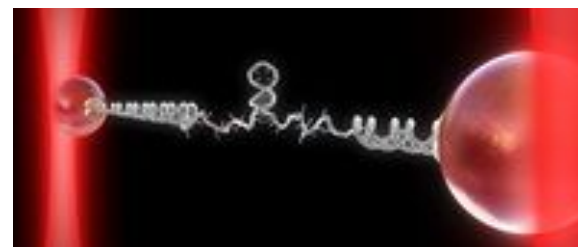
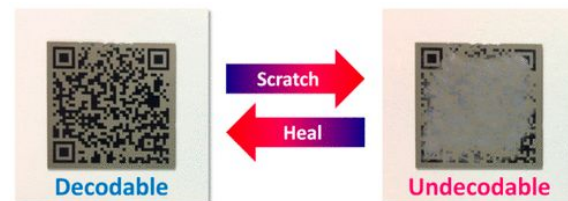
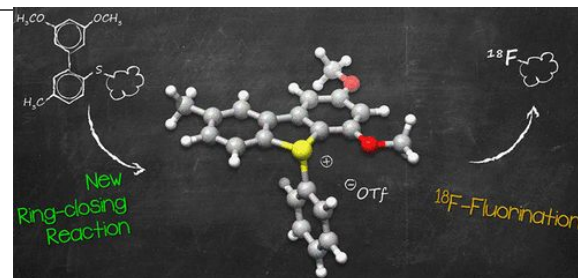
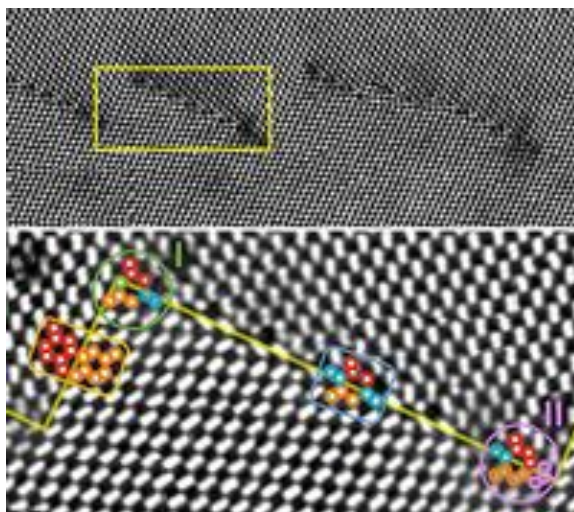
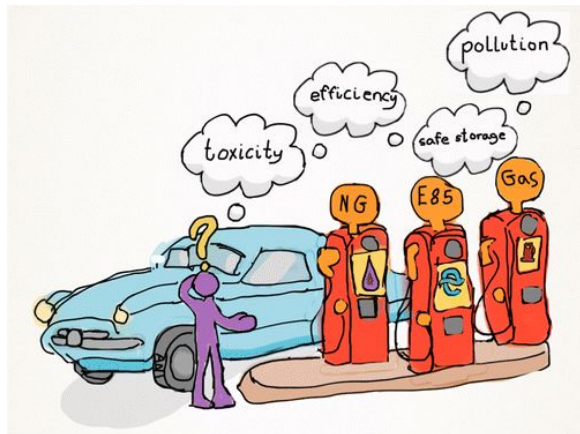
- 1 When the sea floor abruptly shifts from a seismic event, the huge displacement of sea water causes a tsunami wave.
- 2 Initial waves travel 500 to 600 mph and are a few feet tall, but they are not noticeable on open water because the waves are spread out over a long distance.
- 3 As waves hit shallower depths, they decrease in speed while increasing in height.
- 4 Tsunami waves hit shores with deadly force, depositing water and debris. Successive waves may occur.

Sources: NOAA, USGS and Associated Press

MERCURY NEWS

Style advice - Good examples

Striking graphical abstracts



Style advice - No shame in asking for help

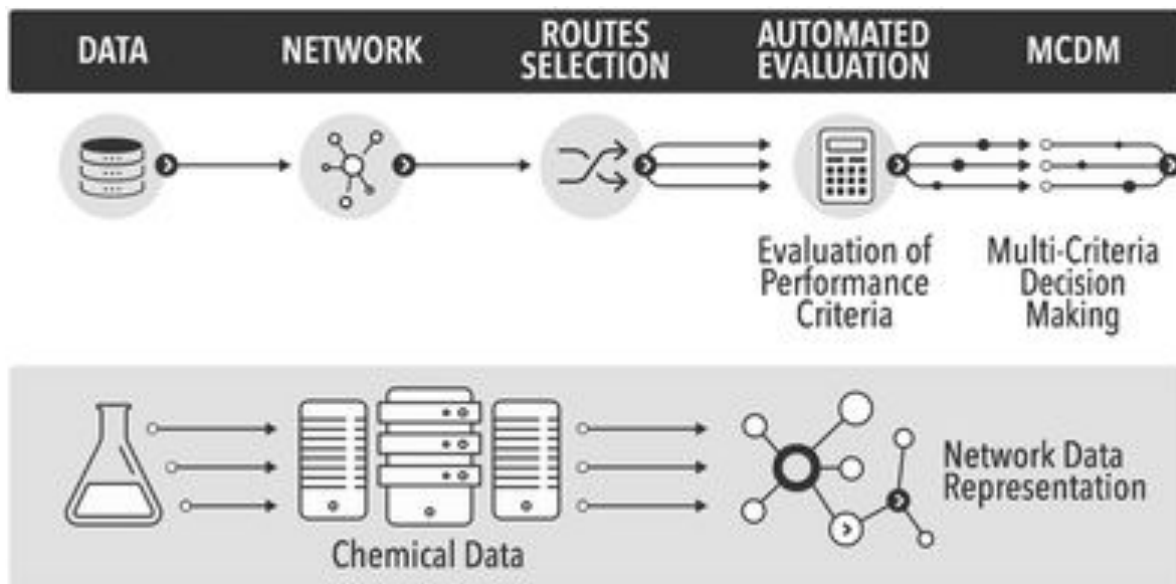
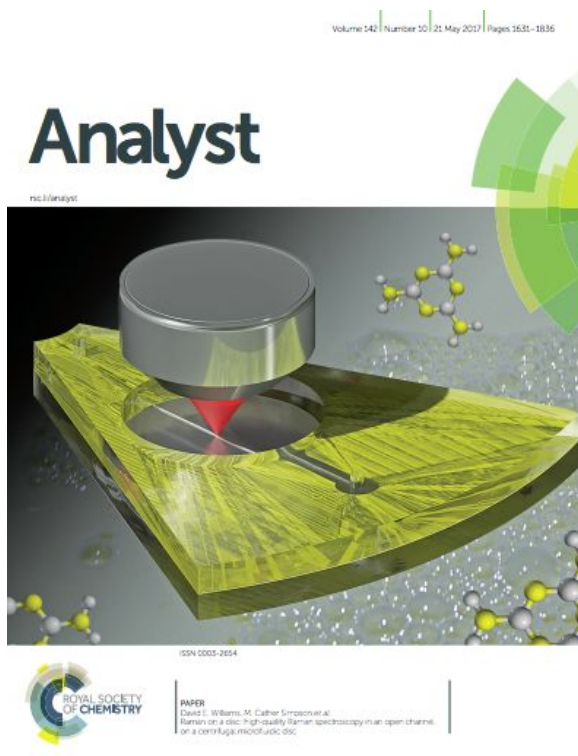
Get a professional in

Get a friend

- Paper for Raman on a disc

Get a professional

- [Alexei's paper](#)



Me vs professional



Me vs professional

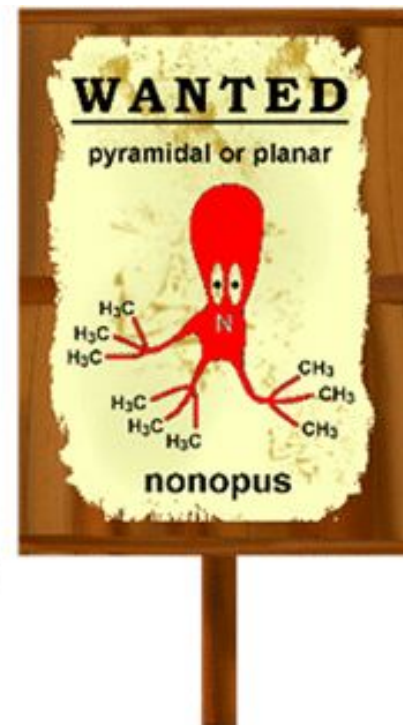
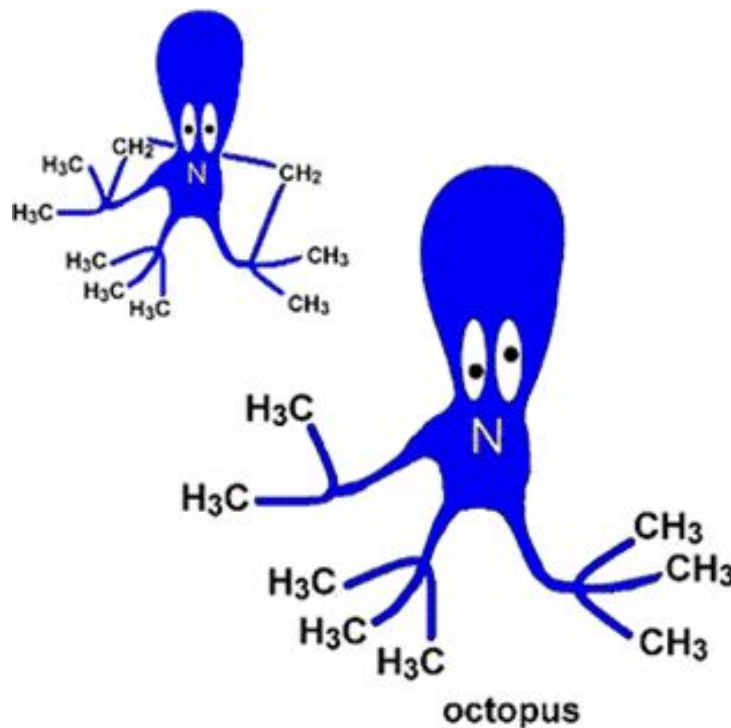
Poetry off the Page



Activity time

Come up with a graphical abstract

1. Get into groups of three
2. Find out the person in your group who is closest to publishing a paper
3. Have the person explain the main findings of the paper briefly
4. Brainstorm some graphical abstracts.
5. After 10 mins we will do show and tell



Why do graphical abstracts?

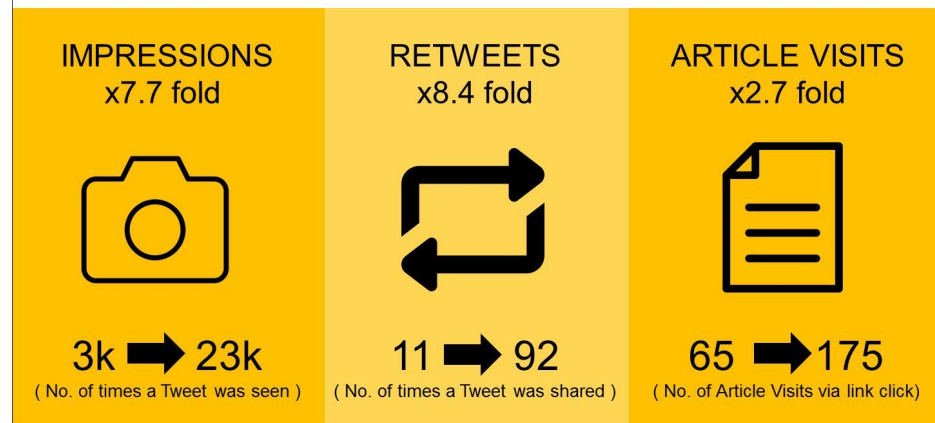
Opportunity to communicate your research

[Pferschy-Wenzig et al. in molecules opensource looking at GA found no correlation with pdf downloads and total citations](#)

[Visual abstract templates for annals of surgery increased click-throughs three-fold](#)

Tweet your paper, post it on Facebook, write a blog about it, email the graphical abstract, use it in your presentations.

Visual Abstracts Increase Article Dissemination:
a prospective, case-control crossover study



Ibrahim et al. *Ann Surg.* April 2017.

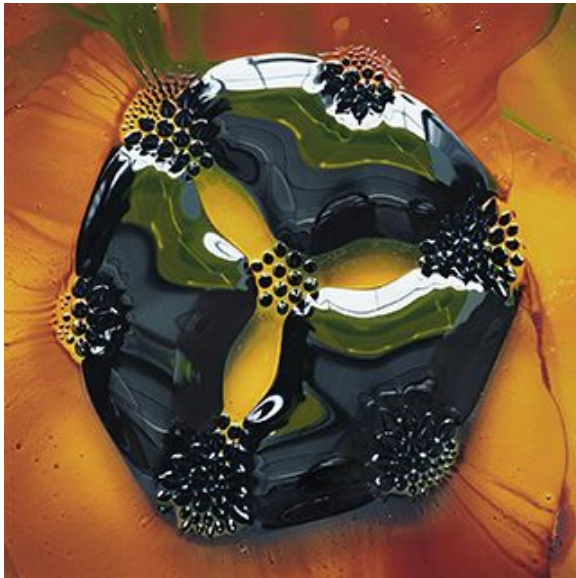
ANNALS OF SURGERY
A Monthly Review of Surgical Science Since 1885

Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved. Published by Lippincott Williams & Wilkins, Inc.

“The huge and unique opportunity a graphical abstract offers to authors is the possibility to drive traffic to their research. It is more than a summary of research. Authors should envision it as the marketing message, the advertisement of their work.” [Luk Cox](#)

Where to next?

Links, courses and interesting things to look out for



[MIT has a free online course on making science pictures that I highly recommend.](#)

[Video course on Inkscape](#)

<http://www.illuscientia.com/resources/graphical-abstract/>

<http://www.storybench.org/how-scientific-american-makes-its-infographics/>

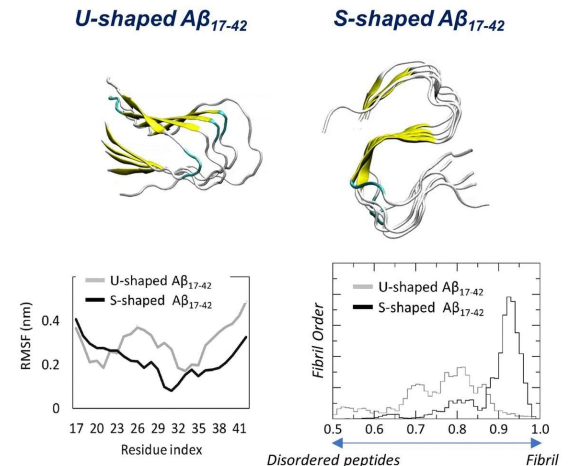
<https://www.nature.com/articles/nchem.1109>

<https://www.wired.com/2011/02/are-graphical-abstracts-a-good-idea/>

<http://tocrofl.tumblr.com/>

<https://www.seyens.com/create-effective-graphical-abstract-guide/>

Videos, blog, animated abstracts



Thanks for listening!

