

# ON-LINE VIDEO AS A SCIENCE COMMUNICATION TOOL

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## Milestones of previous studies:

Morian and Swarts (2012): propose a methodology to analyse instructional online video

Welbourne and Grant (2015): analyse 390 sci-comm online videos for the influence of content-related aspects on popularity, finding user-generated content (UGC), a presenter and fast pace to correlate with popularity

Muñoz-Morcillo et al. (2016): analyse 200 scicomm online videos for typologies and levels of complexity, finding strong storytelling expertise and growing professionalism

Despite the above, there is more professionally generated content (PGC) available.

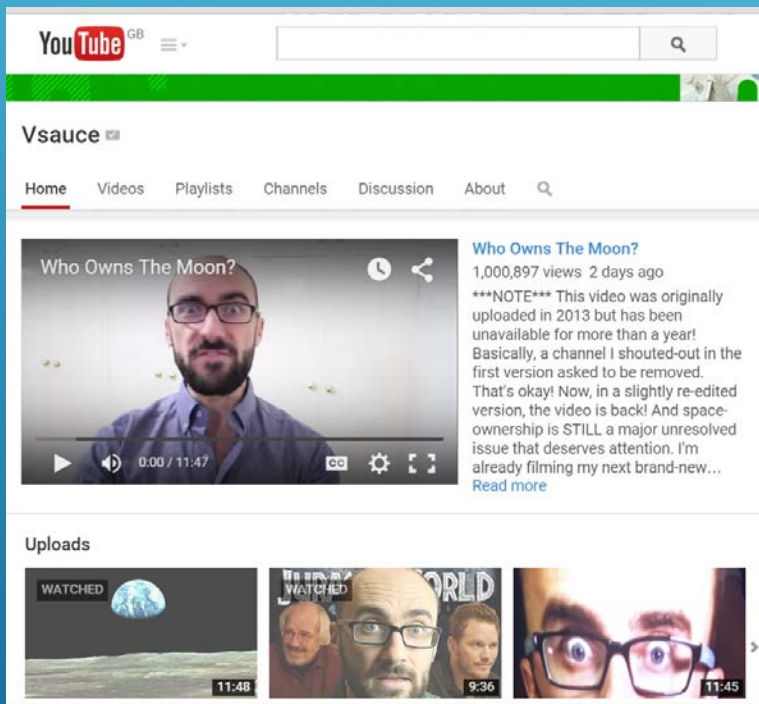
We analyse 5 major channels of such PGC in the UK through interviews with their producers, in order to gain insight on questions like:

What are the aims of institutions and individuals that embark in on-line video production?

What are the similarities and differences between the videos produced by these different institutions and individuals?

A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against a blue background.

# The sample:



**YouTube** GB

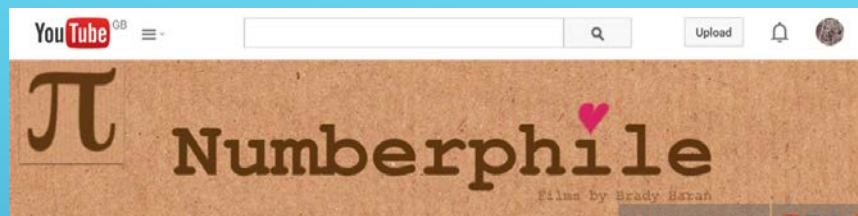
**Vsauce**

Home Videos Playlists Channels Discussion About

**Who Owns The Moon?**  
1,000,897 views 2 days ago  
\*\*\*NOTE\*\*\* This video was originally uploaded in 2013 but has been unavailable for more than a year! Basically, a channel I shouted-out in the first version asked to be removed. That's okay! Now, in a slightly re-edited version, the video is back! And space-ownership is STILL a major unresolved issue that deserves attention. I'm already filming my next brand-new...  
[Read more](#)

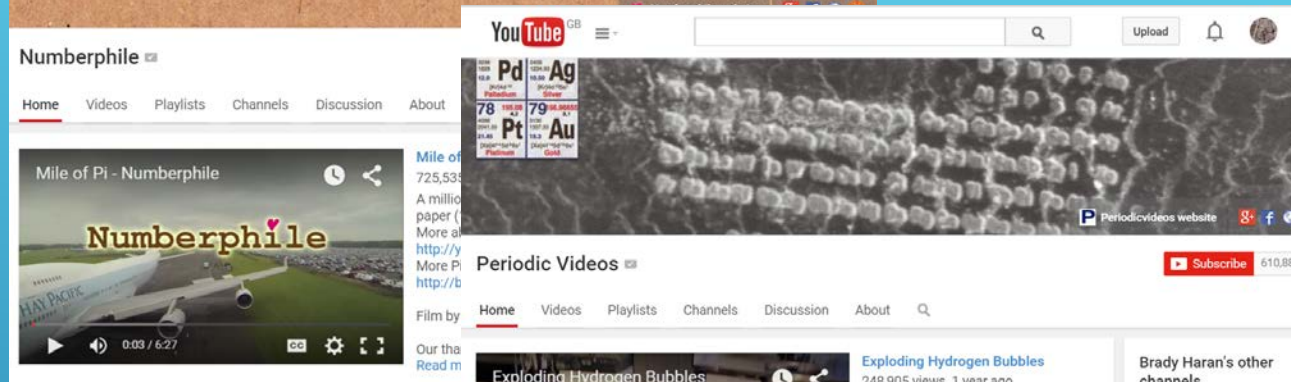
**Uploads**

- WATCHED 11:48
- WATCHED 9:36
- 11:45



**YouTube** GB

**Numberphile**  
Films by Brady Haran



**YouTube** GB

**Numberphile**

Home Videos Playlists Channels Discussion About

**Mile of Pi - Numberphile**  
725,535 views  
A million paper (circles) around the world.  
More at <http://www.numberphile.com>  
More Pi <http://www.numberphile.com>

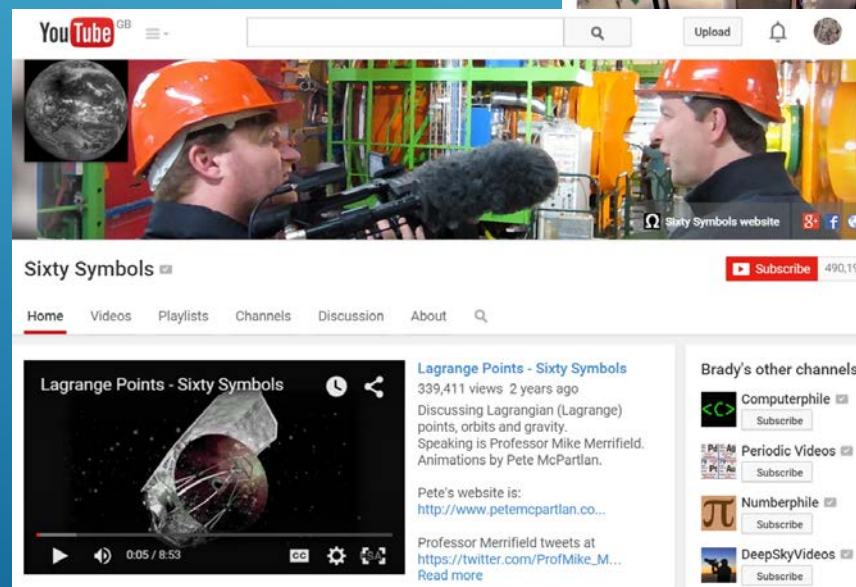
**Periodic Videos**  
610,884 subscribers

Home Videos Playlists Channels Discussion About

**Exploding Hydrogen Bubbles**  
248,905 views 1 year ago  
The title pretty much says it. More chemistry at <http://www.periodicvideos.com/>  
Follow us on Facebook at <http://www.facebook.com/periodic>  
And on Twitter at <http://twitter.com/periodic>  
From the School of Chemistry at The University of Nottingham:  
<http://bit.ly/NottChem>  
[Read more](#)

**Brady Haran's other channels**

- Computerphile** [Subscribe](#)
- Numberphile** [Subscribe](#)
- Sixty Symbols** [Subscribe](#)
- nottinghamscience** [Subscribe](#)



**YouTube** GB

**Sixty Symbols**  
490,190 subscribers

Home Videos Playlists Channels Discussion About

**Lagrange Points - Sixty Symbols**  
339,411 views 2 years ago  
Discussing Lagrangian (Lagrange) points, orbits and gravity. Speaking is Professor Mike Merrifield. Animations by Pete McPartlan.  
Pete's website is: <http://www.petemcpartlan.co.uk>  
Professor Merrifield tweets at [https://twitter.com/ProfMike\\_Merrifield](https://twitter.com/ProfMike_Merrifield)  
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- Periodic Videos** [Subscribe](#)
- Numberphile** [Subscribe](#)
- DeepSkyVideos** [Subscribe](#)



YouTube GB  Upload

**nature video**  95,298

Home Videos Playlists Channels Discussion About

**Uploads**

**Why Pluto?**  
12,370 views • 1 week ago

**Hallucigenia: The worm with the missing head**  
240,707 views • 1 week ago

**Addiction: learning to forget**  
6,080 views • 1 week ago

**Our favourite channels**

- Nature Newsteam
- Scientific American
- Nature Arabic Edition

YouTube GB  Upload

**New Scientist**  136,164

Home Videos Playlists Channels Discussion About

**Dogs diagnose cancer using smell alone**  
2,469 views 3 days ago  
Full story: <http://bit.ly/1Hu7mlS>  
Anecdotes of dogs that can sniff out cancer have been doing the rounds for years, and now the urban legend is being subjected to scientific scrutiny

**Minute Physics**

- Vsauce
- MinutePhysics
- AsapSCIENCE
- Mental Floss

YouTube GB  Upload

**BBC Earth**  468,596

Home Videos Playlists Channels Discussion About

YouTube GB  Upload

**BBC Earth Unplugged**  320,177

Home Videos Playlists Channels Discussion About

**Welcome to Earth Unplugged!**  
136,182 views 1 year ago  
We want to show you why the natural world is awesome! We reveal amazing animal facts, share the latest wildlife news and leave you breathless with our beautiful slow motion videos.  
Subscribe to join our community - <http://www.youtube.com/subs...>  
Facebook...  
Read more

**Channels we love...**

- BBC Earth
- Vsauce
- Brit Lab
- MinuteEarth

YouTube GB

**The Royal Institution**  144,388

Home Videos Playlists Channels Discussion About

How Sunglasses Work - Are They Damaging Your Eyes?

9,219 views 1 week ago

How do sunglasses actually work? How can some types cause damage to your eyes? And why do astronauts wear glasses made of gold? Kate explains all. Subscribe for regular science videos:

**Awesome Science Channels**

Veritasium

MinutePhysics

YouTube GB

**The Royal Institution** Videos Playlists Channels Discussion About

**ExpeRimental**

by The Royal Institution • 24 videos • 16,027 views • Last updated on Mar 19, 2015

A series of short films from the Royal Institution making it fun, easy and cheap to do science at home with your children.

1	Science for kids - How to make microwave cupcakes - ExpeRimental #20	4:24
2	Science for kids - How to make butter - ExpeRimental #19	3:47
3	Science for kids - How to inflate a balloon with a chemical reaction - #ExpeRimental 18	4:31
4	Science for kids - Colour changing cabbage experiment - ExpeRimental #17	3:56

Channel	Days on-line	Number of clips	Average clips per day	Subscriptions	Average new subscriptions per day	Average subscriptions per clip	Views
New Scientist	2901	1533	0.52	117217	40	76	93995402
Vsauce	2656	301	0.11	7995908	3010	26564	698692417
Periodic videos	2344	534	0.22	498288	212	933	75924876
Nature videos	2190	208	0.09	76517	34	367	18573336
Sixty simbols	2092	249	0.11	423946	202	1702	34861248
BBC Earth	2081	953	0.45	393250	188	412	94541087
Royal Institution	1877	242	0.12	102233	54	422	6847636
Numberphile	1148	248	0.21	1064648	927	4292	97301915
Earth Unplugged	734	365	0.49	288763	393	791	30861199
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Questions asked:

Aim of the channel, intended audience

Style of videos

Management and organisation

Relationship with subscribers/viewers who comment

Science communication

Difference from TV

Own channel's distinctive feature

And the million dollar question: what makes a video popular?



	Brady Haran	Nature	New Scientist	BBC Earth/unplugged	RI
Aim/ target	<p>Personal interest, enjoyment of sharing, of meeting the best scientists.</p> <p>Any audience – no knowledge + interest</p>	<p>Visual aid to published articles.</p> <p>PR &amp; Brand recognition</p> <p>Scientists, students, topic- interested public. 50-60% from external news outlets and on-line publications</p>	<p>Tell stories.</p> <p>Show content that does not go well in words.</p> <p>Clips are embedded in articles (so audience same as print journal), but get views through YouTube.</p>	<p>Reach a younger audience (16-34).</p> <p>Communicate with a community.</p>	<p>Widen engagement with science, increase presence of science in web.</p> <p>Bridge culture gap.</p> <p>Experimental was for parents with kids, to prepare visit to exhibition.</p>

	Brady Haran	Nature	New Scientist	BBC Earth/ unplugged	RI
Management and organisation	<p>Single worker. Frequent uploading. No monitoring beyond number of views and subscribers. "The next video is more important than the previous ones"</p>	<p>Team (multimedia dpt.) 2FTE + freelancers for filming or animation. When needed (3 -4 per month). Monitor sources of embedding rather than number of views.</p>	<p>Single worker Animations and editing in-house – footage often contributed by scientists. 1 per day. Organised in playlists. Monitor stats.</p>	<p>25 people creating content. Young, understanding the platform. 2 senior staff. "Community manager". Heavy social media presence.</p>	<p>Single worker + temporary collaborations. Aim to have video producer and animator roles. Supported by digital content manager. 1 per week. Closely monitor for future production</p>

	Brady Haran	Nature	New Scientist	BBC Earth/unplugged	RI
Style	<p>"Real places with real people." Mainly interviews, but with <b>constant change</b> driven by own feeling. Mostly single camera, s.t. up to 4.</p>	<p><b>No set style.</b> Sponsored videos have sponsor style. <b>Early access to researchers themselves</b> and a fair amount of scientific detail (vs. e.g. BBC)</p>	<p>Very short (they illustrate articles) with research footage. Sometimes <b>try out other formats</b>, like demos, or self-contained clips, with animations. Cutting edge research. Humour, music.</p>	<p>Looking into camera. Close-ups. <b>Clear structure:</b> title/straight-to-the-point/<b>conversations with community</b></p>	<p>Common intro and credits, otherwise <b>loose style.</b> Light hearted, <b>humour</b>, personable. Quirky silly. Heritage. <b>Not linked to research papers.</b> Starting to see viewers watch longer videos as well.</p>

	Brady Haran	Nature	New Scientist	BBC Earth/unplugged	RI
Difference with TV	<p>Time: Freedom. No pre-set duration, no limitations for shooting. Contents dictate. TV lack of choices. TV is expensive. TV could be a launch-pad/showcase.</p>	<p>Needs of story determines duration (usually short, 3-7 minutes). Freedom, no constraints. Able to experiment (← cheap).</p>	<p>Shorter. TV has different standards. More experimental. No need of long narratives.</p>	<p>Duration as needed. Vague planning – “respond to community” – optimizing expenses. Quick production. Longer shelf-life. Collaboration with competitors. Flexibility to make changes following “conversations”. Driven by audience interaction. On-line as a platform for TV.</p>	<p>Lower budget. Different timescales. More informal. Contents that would never go on TV. Longer shelf-life. Builds communities, interaction with audiences. Less constraints.</p>



	Brady Haran	Nature	New Scientist	BBC Earth/unplugged	RI
Relationship with viewers	Two way relationship only to gauge "What do audiences want" – no involvement. Communities are created around comments – no direct involvement by BH	Contact with bloggers. Very little contact with viewers (they engage with each other). No involvement with comments.	Check comments but don't interact. Someone else in charge of social media.	All encompassing, permeates all aspects.	Reads all comments. Often responds, sometimes with new videos, addressing specific viewers. Commenting viewers create community. Try to get researchers to respond themselves.

	Brady Haran	Nature	New Scientist	BBC Earth/unplugged	RI
Science Communication	<p>Reaches millions (as compared with school visits or lectures).</p> <p>Supplies demand regarding format</p> <p>read → hear → <u>see</u></p>	<p>On-line/video is not appropriate for every story.</p>	<p>Best medium for some stories.</p>	<p>Important to go beyond and reconnect people with the planet driven by ethics.</p>	<p>Good for dissemination, inspiration, keeping in contact.</p> <p>Video is sought over text by young viewers.</p>

	Brady Haran	Nature	New Scientist	BBC Earth/ unplugged	RI
What makes a video popular?	<p>Sustainable popularity: likeable people, quality, constancy</p> <p>Single video: something not seen before (e.g. slow motion /timelapse) + social sharing → short, catchy title &amp; thumbnail</p>	<p>Social sharing and embedding.</p> <p>Media buzz. Subjects.</p> <p>New striking research.</p> <p>Quirky/unusual.</p> <p>Quality.</p>	<p>New, not seen before.</p> <p>Quirky, visually striking.</p> <p>Intriguing.</p> <p>Being the first of its kind.</p> <p>Good title.</p>		<p>Push in social media</p> <p>"Shareability".</p> <p>No time-wasting.</p> <p>Topics.</p> <p>Visually stunning things. Things not seen before.</p>

# Conclusions:

There are some common themes across most video channels:

- Small workforces
- No set style
- Appreciation of freedom from production constraints
  - Particularly letting the content/stories drive duration
  - To experiment with formats, contents, styles....
- Awareness of importance of communities created, but very little interaction with them
- Success is intertwined with social sharing
- Importance to find novel content "never seen before"

BUT the most interesting insights come from one single channel: BBC Earth/unplugged

- A deep understanding of the radical difference and uniqueness on-line video offers in the way to interact with audiences with societal impact.



## References:

Morian, M., & Swarts, J. (2012). 'YouTutorial: A Framework for Assessing Instructional Online Video'. *Technical Communication Quarterly*, 21, pp. 6-24.

Muñoz Morcillo, J., Czurda, K. and Robertson-von Trotha, C. Y. (2015), 'Typologies of the Popular Science Web Video'. Preprint from <http://arxiv.org/abs/1506.06149>

Welbourne, D.J., and Grant, W.J. (2105). 'Science communication on YouTube: Factors that affect channel and video popularity'. *Public Understanding of Science*;

Most popular videos (at time of study):

Vsauce (14 million views):



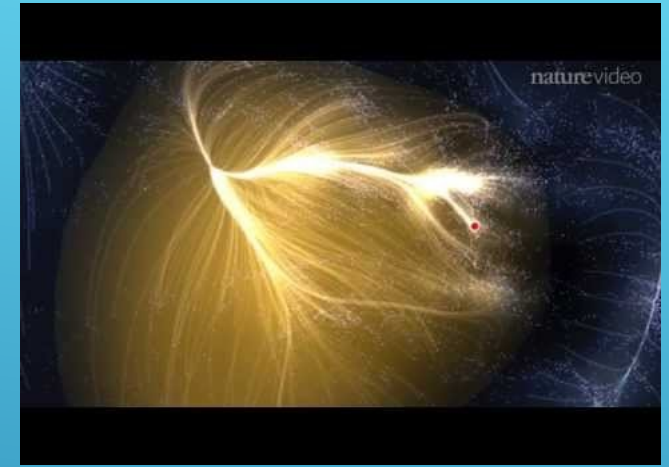
[https://youtu.be/jHbyQ\\_AQP8c](https://youtu.be/jHbyQ_AQP8c)

Brady Haran (8.7 million views):



<https://youtu.be/NddZ5ftQb0Q>

Nature (2.5 million views)

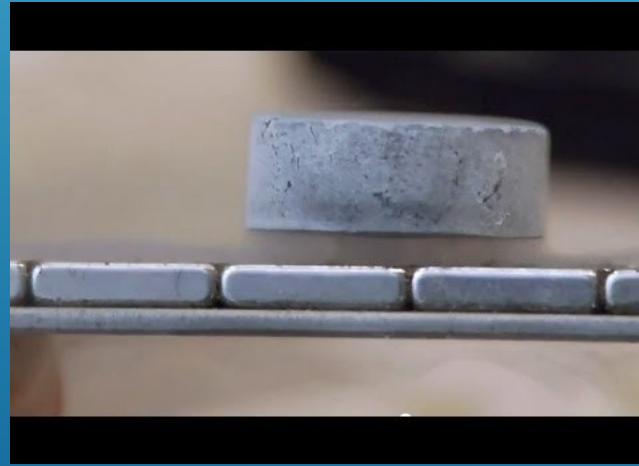


<https://youtu.be/rENyyRwxpHo>



New Scientist (3.4 million views):

<https://youtu.be/ScvdFeh1aOw>



Royal Inst. (1.1 million views):

<https://youtu.be/zPqEEZa2Gis>



Earth Unplugged (4.1 million views):

<https://youtu.be/jc8Hno4M0Qs>