



The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

From Test-Tube to YouTube

Martyn Poliakoff

martyn.poliakoff@nottingham.ac.uk

Public Engagement (Involvement) in Science

- Why do Scientists participate?
- My own experience
- More general conclusions?

What makes live lecture demonstrations exciting?

- Clear and striking effect
- **An element of surprise**
- Illustrate a relevant scientific point
- **Audience feels that something may go seriously wrong!**



“Duty to communicate with the Public”

- **Wolfendale Committee (1995)**
- Council for Science & Technology
- **Research Councils & other funders**
- Pressure from Universities
- **Need to recruit students**

Science Communication

Volume 29 Number 2

December 2007 242-263

© 2007 Sage Publications

10.1177/1075547007308009

<http://scx.sagepub.com>

hosted at

<http://online.sagepub.com>

What Factors Predict Scientists' Intentions to Participate in Public Engagement of Science Activities?

Ellen Poliakoff

University of Manchester, UK

Thomas L. Webb

University of Sheffield, UK

Factors that are relatively unimportant

- Time constraints
- Shortage of funding
- Lack of career recognition

What is more important?

- Scientists have participated before
- **Think it's a worthwhile activity**
- Believe that they have the necessary skills
- **Think that their colleagues do it!**

**Why did I start in Public
Engagement?**

In 1974, I was working on
photochemistry
in Newcastle upon Tyne



**My sister asked me to give
a lecture at her school in
London**

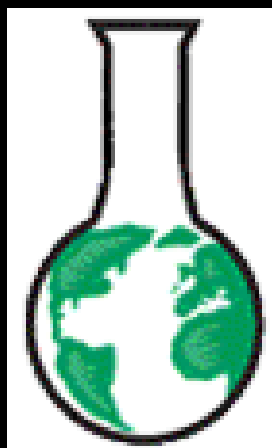
**The Lighter Side of
Chemistry**

I teach Chemistry

Professor Martyn Poliakoff
and the Wiggly Giggly™

Green Chemistry

Cleaner approaches to
making chemicals & materials

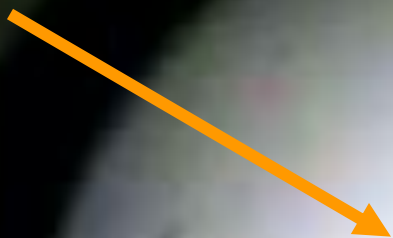


Supercritical Fluids

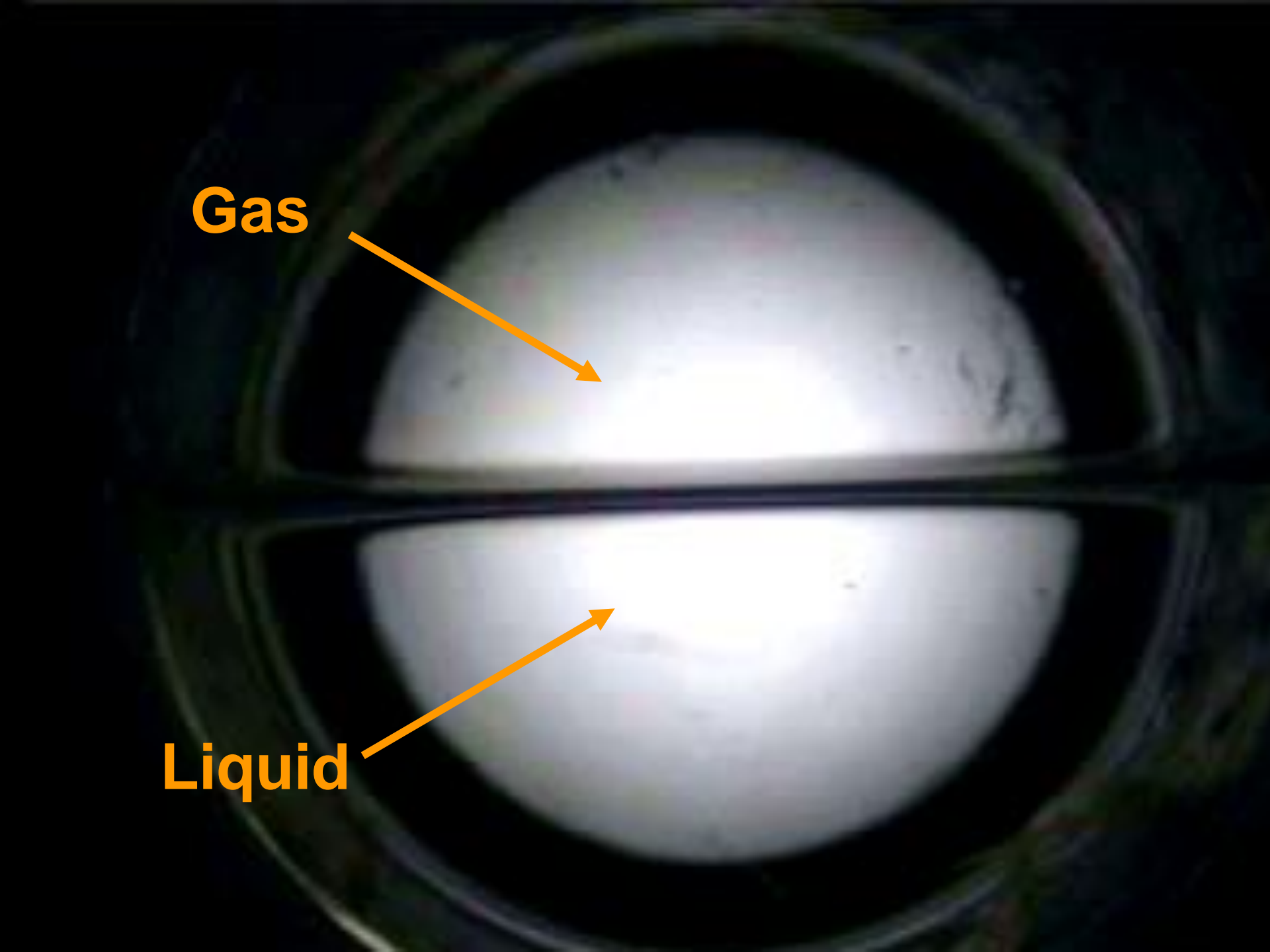
Supercritical Fluids

Highly compressed CO_2 or H_2O
which can be used as solvents
for reactions

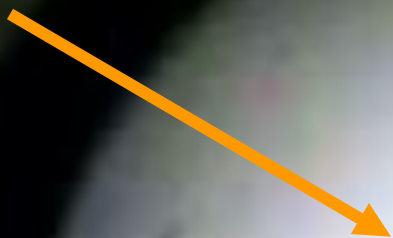
Gas



Liquid



Gas



Liquid



Royal Society Summer Exhibition 2002



PUTTING THE FIZZ INTO CHEMISTRY!

Supercritical Fluids:
Clean Solvents
for Green Chemistry

What happens when
a liquid is heated in
a sealed container?

Supercritical

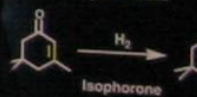
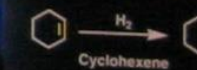
Polymer

Polymer in $scCO_2$

Reactions in



From lab to p



**Funding from the
Engineering & Physical
Sciences Research Council**

Public Awareness
Scientist

Dr Samantha Tang

July 2004

Supercritical Fluids in the Victoria Shopping Centre



Supercritical Fluids on TestTube

YouTube GB



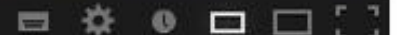
Upload

GUIDE

MORE FROM Test Tube



1:29 / 4:23



Supercritical fluids



nottinghamscience · 384 videos



Subscribe

50,516

186,679

1,091 likes 8 dislikes

Brady Haran, video journalist



THE PERIODIC TABLE OF VIDEOS



The University of
Nottingham



Click on any element to launch video

= recently updated

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	**	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut	Uuq	Uup	Uuh	Uus	Uuo
		*	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
		**	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

THE PERIODIC TABLE OF VIDEOS



ELEMENT: Hydrogen

SYMBOL: H

ATOMIC NUMBER: 1

[Previous element](#) [Close window](#) [Next element](#)





Periodic Table of Videos

- Filming started June 9th 08
- **Website completed July 17th 08**
- 120 videos for 118 elements
- Total film time 4 hours 7 min

Comments on YouTube

- *awesome vids wish i had of found them before i did my science gcse exam*
- ***i love your videos. Just watching these videos ive lernt more than a full term at colege.***
- *Videos like these is what makes me interested in School and better improving my self. Thank you!*

Starring role on YouTube

Tim Reynolds
 Martyn Poliakoff, Nottingham University, UK, opened the second European Chemical Congress in Turin, Italy, co-organised by EuCheMS (European Association for Chemical and Molecular Sciences) and the 'other' SCI (Societa Chimica Italiana) with a discussion of his remarkable success in promoting chemistry on the YouTube video website.

Poliakoff and his research team star in over 120 short videos that describe the history



BBC Home News Sport Radio TV Weather Languages

BBC TURKISH.com

Yardım | Sadece metin | BBCTurkish.com'u ana sayfam yap

Son güncelleme: 16 Temmuz, 2008 - TSİ 13:33

✉ Bu sayfayı arkadaşşıma gönder 🖨 Yazıcı için

Haberler
Basın Özeti
Dünyaya Açılan Pencere
Özel Dosyalar
Haberlerle İngilizce

BBC TÜRKÇE RADYO Nottingham Üniversitesi'nden

Periyodik tablo internette 'canlandı'
İngiltere'de bir üniversite kimyaya olan ilgiyi artırmak için daha önce denenmiş bir yöntemle başvurdu.

הסימנייה

עושה הנפלאות מנוטינגהאם

פרופסור בריטי הופך את טבלת היסודות המחזורית ללהיט רשת רותח

את הטבלה המחזורית, שמציגה את היסודות שמרכיבים את כל החומר בסביבה, ניסח במאה ה-19 הכימאי הרוסי דמיטרי מנדלייב. בניקונים קלים הוכיחה עצמה הטבלה בתחילת המאה ה-20, אבל תכונותיהם של יסודות שטרם התגלו כשהומצאה הטבלה. אצל מנדלייב, לך תשכנע תלמידים, או אפילו את עצמך, בקסם שמסתתר בשורות-שורות של מספרים ואותיות לטיניות. אז אוניברסיטת נוטינגהאם הלכה ושכנעה: היא לוקחה את הטבלה המחזורית והצמידה לה סרטונים שבהם מדוען עושה ניסויים מוזיקליים עם היסודות השונים. את הניסויים מבצע הכימאי פרופ' מרטין פוליאקוף, איש המרכז משקפים ענקיים שנשמע כמו גברת בריטית בשעת התה ונראה כאילו ביקש מהספר 'תעשה לי תספורת אלברט איינשטיין, אבל שיהיה פרוע'.

בניסוי של הליום, למשל, מצוין פוליאקוף בהנאה בלון מלא הליום, שמתפוצץ ובוער בעליזות. הנתרן לעומתו הוא הגרסה הכימית של המריקה בכיכר ריינג'ון:

כשמכניסים אותו למים, הוא מתחיל לבעור. אחר כך הוא מתפוצץ. כמעט 2 מיליון גולשים כבר צפו בניסויים החמודים, ואתר ווב 2.0 אמיתי, יש באתר גם סטטיסטיקות בזמן אמת. בזמן ליום המשיב בצהריים, היסודות הכי פופולריים אצל הגולשים הם סודיום (Na) והליום (He) והיסוד התיב עליי – המוצן (O).

www.periodicvideos.com

עידו קינן



עושה קסמים עם סודיום. פרופ' פוליאקוף

Mail Online

sciencetech

Fizz, bang, whoosh ... British scientists turn Periodic Table into a must-see internet hit



Internet sitesi periyodik tabloyu öğrenciler için ilginç kılacak bir yöntem olarak değerlendiriliyor

ДЕЛОВАЯ ПРЕССА

Главная О проекте Партнеры Рассылка Свидетельства СМИ Реклама Контакты

NOVYE TENNOLOGIYI номер 63 (436)- 64 (436) от 01.08.2008

Архив Яндекс Директ

Education

September 15, 2008
 Volume 86, Number 37
 pp. 42-43

Elements Achieve Internet Stardom Video clips featuring the periodic table of the elements strike a chord with YouTube fans

Stephen K. Ritter

PERИОДИЧЕСКАЯ ТАБЛИЦА ЭЛЕМЕНТОВ
 Группа специализированных видеороликов, посвященных периодической таблице элементов, размещенных на YouTube, привлекла внимание тысяч зрителей, став популярной темой для обсуждения в интернете.

Таким способом, как известно, можно привлечь внимание к предмету, сравнительно недавно появившемуся в научной литературе.

**“I don’t care what
they do, as long as
they keep making
videos!”**

Viewer’s comment late July 2008

Extras



Nobel Prize



Hadron



Olympics

Gold, Silver, Bronze (**41,094 in 2 months**)

Helium & LHC (**68,668 in 2 weeks**)

Nobel Prize 2008 (**39,027 in 1 week**)

Cheeseburger in HCl (**5 million hits in 21 days**)

Gold Bullion Vault (**2 million hits in 15 days**)

Candles at Halloween (**226,213 hits in 3 days**)

Tea Chemistry (**123,770 in 3 days**)

893,904 subs at 20-47, Feb 13th 2017

Roentgenium - Periodic Table of Videos

PERIODIC VIDEOS



234 videos

Subscribe



periodicvideos — 22 March 2010 — Roentgenium is element number 111 and was created at GSI in Germany, where we made this film. More at <http://www...>



11,158
views



High Speed camera



Hydrogen Explosions (slow motion) - Periodic Table of Videos

New Labs & Old



2015

1935



THE PERIODIC TABLE OF VIDEOS



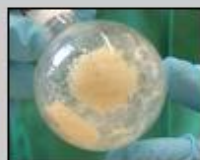
The University of
Nottingham

[Extra videos](#) [Molecules](#) [Roadtrips](#) [Photos](#) [YouTube](#) [Twitter](#) [Facebook](#) [Blog](#) [Rss](#) [Contact](#)

MOLECULAR VIDEOS supported by [EPSRC](#)



Chem Garden



Death Factor



Carvone



Concrete



Frog Poison



Viagra



Traffic Lights



CO₂ (part 1)



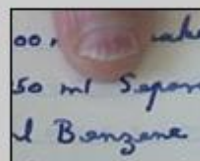
CO₂ (part 2)



Cheeseburger



BBR₃



Benzene



HCl (part 1)



HCl (part 2)



Methane



Heavy Water



Fire Water



Gun Cotton



Sulfuric Acid



Planar Methane



Ferrocene



Snowdon



W/Phosphorus



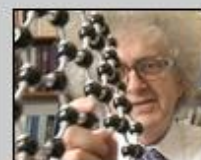
More P₄



Morphine



Penicillin



Graphene



More D₂O



Aqua Regia



Red Sludge

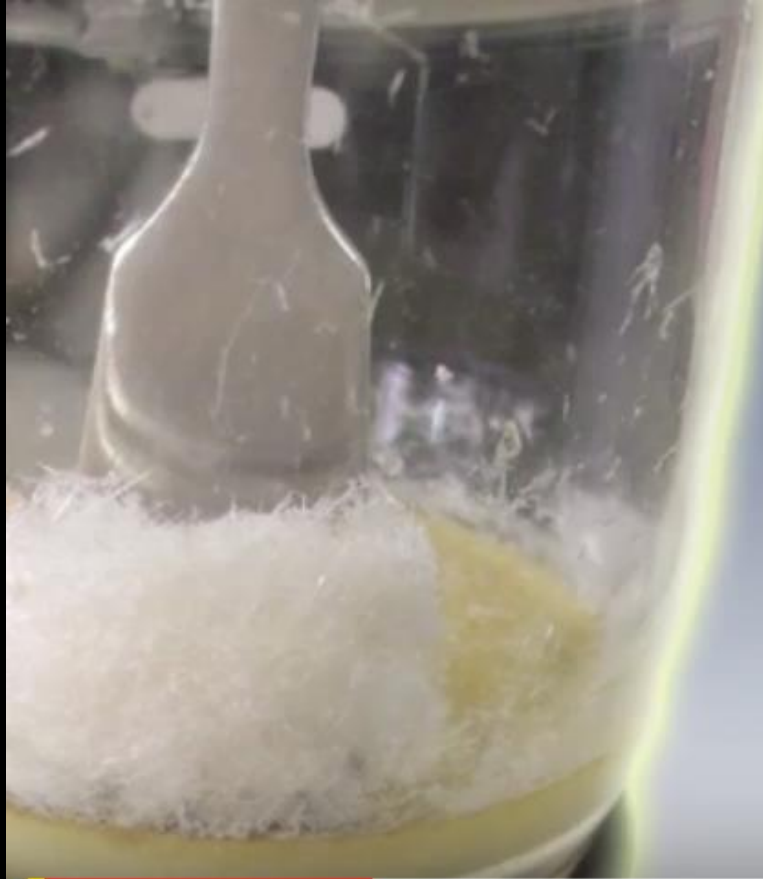
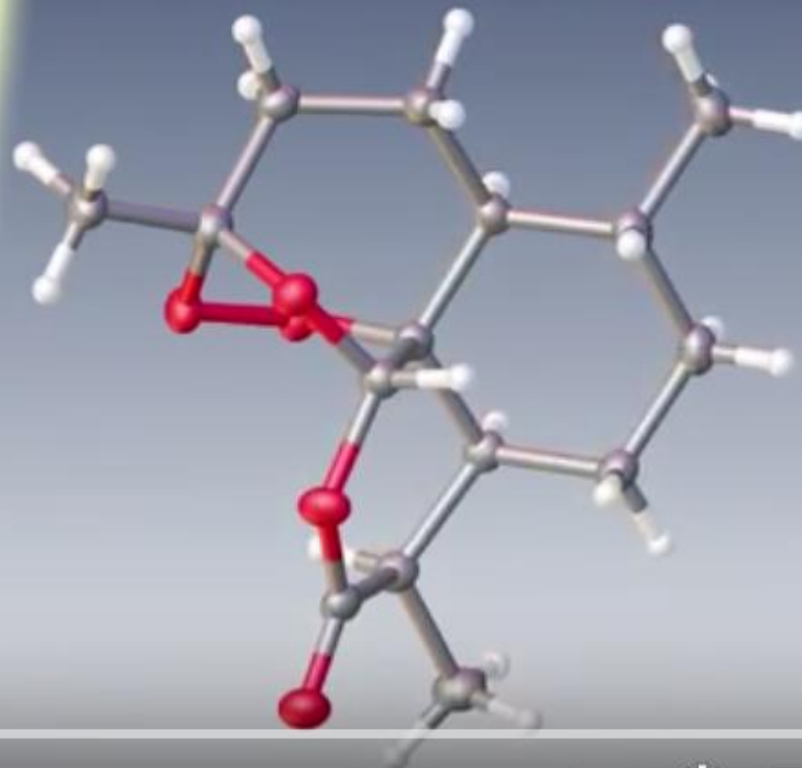


Buckyball

www.periodicvideos.com



Artemisinin



Fighting Malaria with Green Chemistry (Artemisinin) - Periodic Table of Videos

www.periodicvideos.com

46 Pd 106.42 Palladium	47 Ag 107.87 Silver
78 Pt 195.08 Platinum	79 Au 196.97 Gold

Periodic Videos



99,840

http://ed.ted.com/periodic-videos

PERIODIC VIDEOS

A lesson about every single element on the periodic table

Created by the [Periodic Videos](#) team using the [TED-Ed](#) platform.

1 H Hydrogen																	2 He Helium
3 Li Lithium	4 Be Beryllium											5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
11 Na Sodium	12 Mg Magnesium											13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
55 Cs Cesium	56 Ba Barium	+	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
87 Fr Francium	88 Ra Radium	*	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Uut Ununtrium	114 Fl Flerovium	115 Uup Ununpentium	116 Lv Livermorium	117 Uus Ununseptium	118 Uuo Ununoctium
		+	57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
		*	89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium

Hydrogen - Periodic Table of Videos



818,599 Views

2,204 Questions Answered

Let's Begin...

The team at [periodicvideos](#) has created a TED-Ed Lesson for every element of the periodic table. This one is about hydrogen and an exploding balloon. But what creates the fireball?



Watch

Think

Dig Deeper

Discuss

...And Finally

Customize This Lesson 45

Create and share a new lesson based on this one.

About TED-Ed Selects

TED-Ed Selects are exceptional, user-created lessons that are carefully selected by volunteer teachers and TED-Ed staff.

Meet The Creators



Share



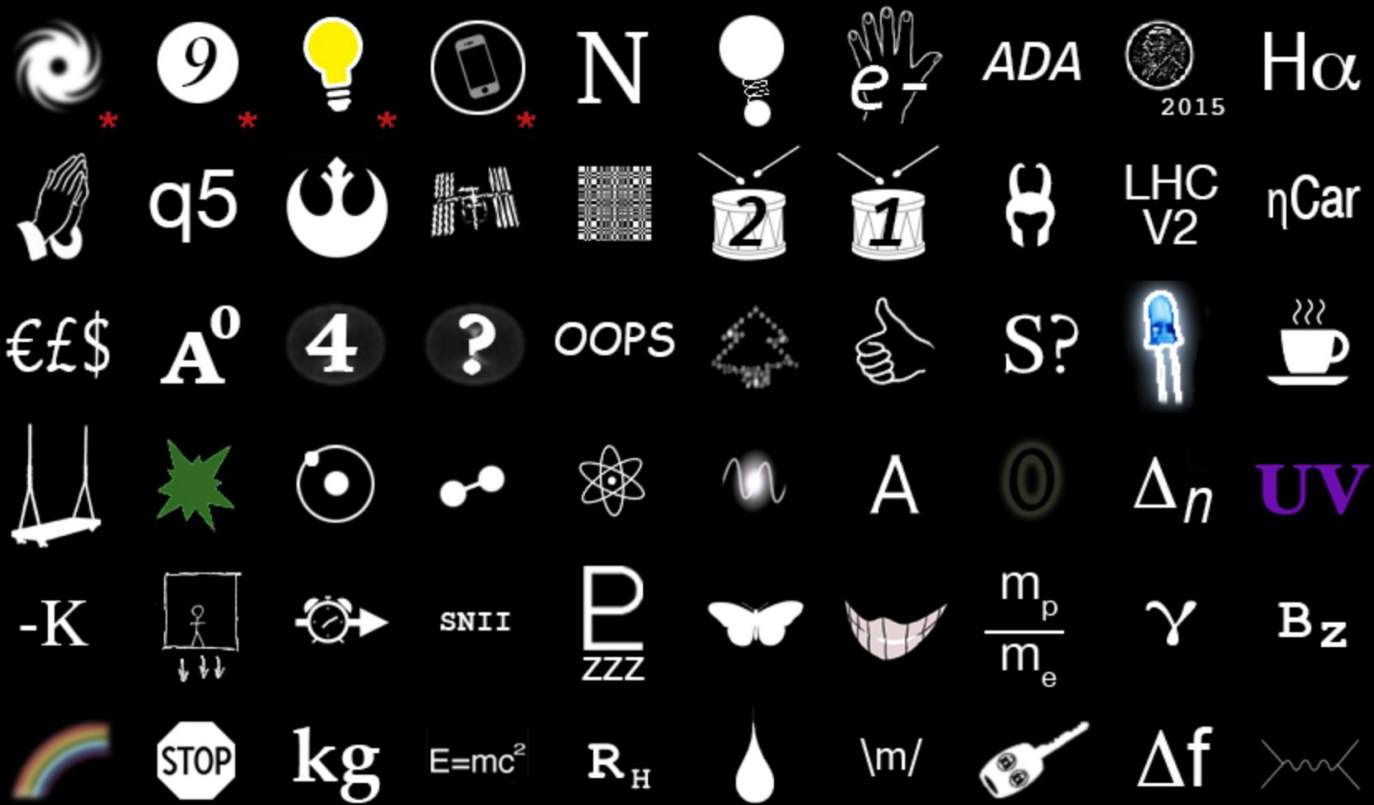
SIXTY SYMBOLS

Videos about the symbols of physics and astronomy

* = recently updated

Home - More Symbols - Planets - LHC* - Scientists - Project - YouTube - Twitter - Facebook

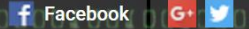
Chemistry - Test Tube - Numberphile - Deep Sky Videos - Backstage Science



Okay, we've slightly overshoot sixty?

<C>

<computerphile>



Computerphile

Subscribe 742,245

- Home
- Videos
- Playlists
- Channels
- Discussion
- About



Password Choice - Computerphile

341,309 views 6 months ago

How do you pick the perfect password? Is it as simple as XKCD make out, or is there more to it? Dr Mike Pound follows on from his password cracking video.

Password Cracking on a 4x Titan X Beast:

<https://youtu.be/7U-RbOKanYs>

EXTRA BITS: https://youtu.be/kFQ_W8zAplc

Indie Game Developer:

<https://youtu.be/da5RoS4w5YU>

Indie App Developer: <https://youtu.be/yVRtJbXQsL8> ...

[Read more](#)

Brady Haran's other channels

Numberphile ✓
Subscribe

Sixty Symbols ✓
Subscribe

Periodic Videos ✓
Subscribe

PsyFile
Subscribe

PhilosophyFile
Subscribe

DeepSkyVideos ✓
Subscribe

nottinghamscience
Subscribe

Uploads



**Are we making any
impact?**

***B. Haran, M. Poliakoff,
nature chemistry 3 (2011) 180***

Assessing Impact

- Number of views?
- Number of Subscribers?
- **Comments**

**02/02/17 My name is Mike Campbell
I'm writing to thank you from
Halifax, Canada.**

My 10 year old son, Ewan, has developed a great interest in scienceso I found your app and let him explore. **He loves it, has learned so much and really seeks to understand the chemistry.** He watches your videos over and over, really enjoys them, and truly learns from them.

I never took chemistry in school but i have enormously enjoyed these videos.

I work in a high school in the US, I am a janitor.

I will give your web site to the science department. I am sure that it will be used in their classes.

Comment from an Expert

Prof. Poliakoff:

“I just watched your video on the new elements, 114 and 116, and found it exceptionally well done, accurate and insightful. What a delight.”

Paul J. Karol

(Chair of the IUPAC/IUPAP committee)

Eddie, age 11, Arkansas, USA





Viewer Pictures - Periodic Table of Videos

PERIODIC VIDEOS

352 videos

Subscribe



Our youngest viewer – 18 months old

**Our most
faithful fan,
Nagayasu
Nawa,
in Tokyo
Feb 2016**



A few encounters with fans, 2016

- Restaurant in Helsinki, Finland
- **Gents, Tallinn Airport, Estonia**
- Chatelet Metro Station, Paris
- **Cyclist in the street at night, Beijing!**
- Buying a Christmas Tree, Nottingham
- **Flight BA084, Vancouver → London**

Capt Phil Guest



What is really important in Public Engagement?

- Enthusiasm
- Enjoyment
- Honesty

Live vs On-line?

Live

- **interaction with the audience**
- Things go wrong
- **Safety constraints**
- Small numbers

On-line

- Remote from audience
- **Hard to believe**
- Have to be responsible
- **Huge Reach**

Should one have Educational Objectives?

- Need to help teachers to do their job
- Convey the message

“Science is worthwhile and even more fun than you think!”

**“Some of the best science communication is being done in online videos
periodic videos”**



The PTOV Team



Neil Barnes, RSC Presidential Award, 2016



The University of
Nottingham

www.periodicvideos.com

Martyn Poliakoff, Brady Haran,
Pete Licence, Steve Liddle, Sam Tang,
Debbie Kays, Darren Walsh, John Moses,
Rob Stockman and Neil Barnes

***EPSRC, COST, U Nottingham, Briggs plc,
RSC, Aldrich Chemicals, Microsoft,
Anamax Charitable Foundation, RACI,
DeSorcy family***

OUR 500TH VIDEO

OUR 500TH VIDEO