



Universities and Citizen Science: from local to global

Muki Haklay, Extreme Citizen Science group

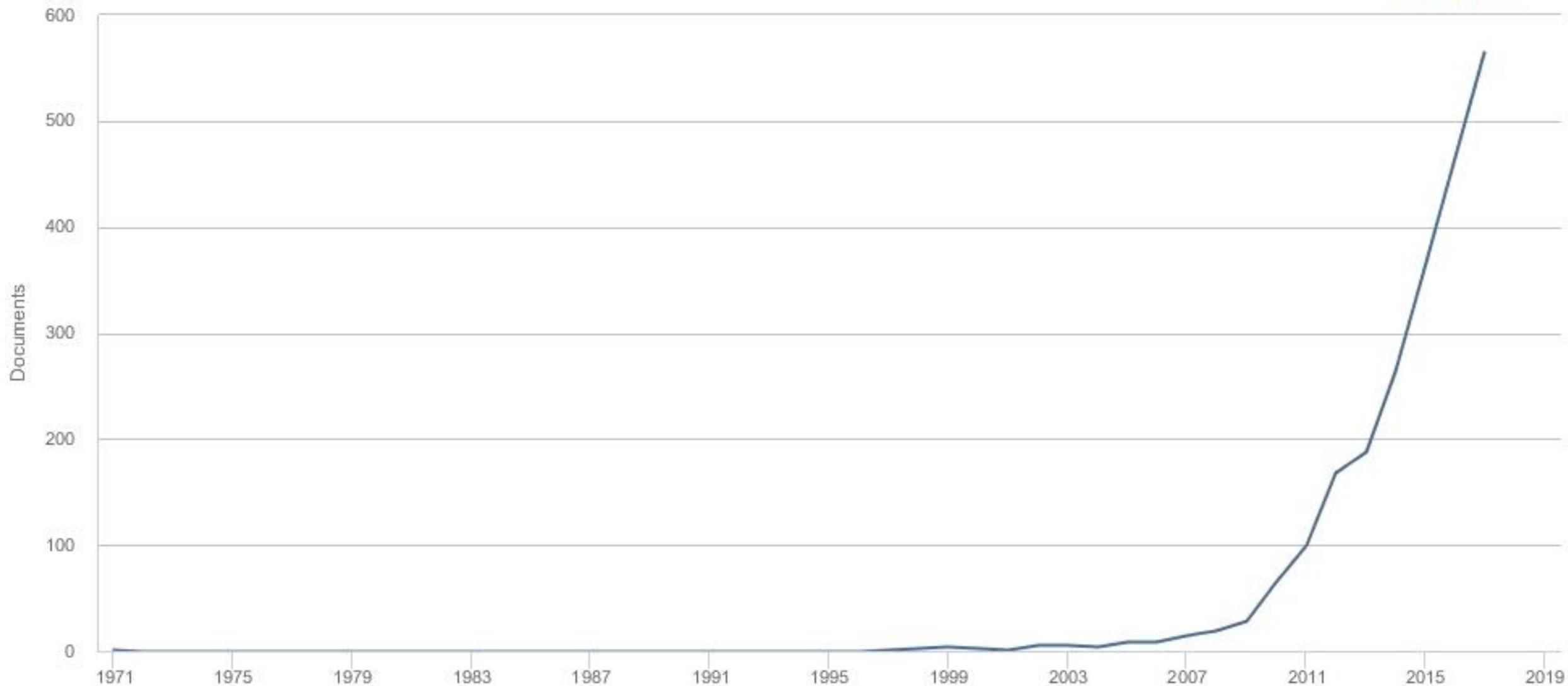
Department of Geography, UCL

Twitter: @mhaklay / @ucl_excites



Synopsis

- The growth of citizen science
- Overview of citizen science activities today: Modes of participation; Relationships between scientists and the public; The role of technology
- Learning about citizen science
- Citizen science and university – challenges and opportunities



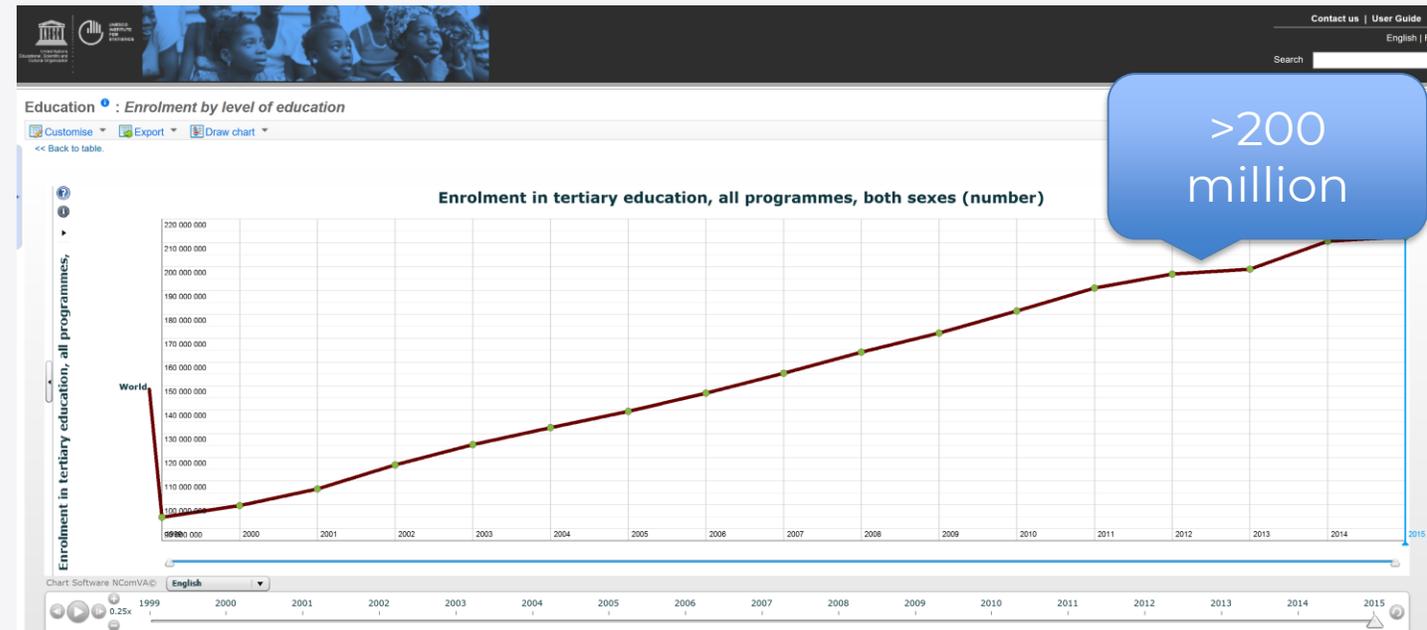


Underlying trends

- Levels of education (esp. rise in higher education)
- Technological developments (Web, mobile phones, broadband)



R Nial Bradshaw





Citizen science at UCL

- With a longer history of public participation in research (going back to the 1980s), but a clear growth over the past decade
- Crossing disciplinary boundaries – medical, health, engineering, life science, physical sciences, earth science, geography, social science, and humanities
- Growing community of researchers and practitioners with knowledge of the field



Citizen Science

Long running
Citizen Science

Citizen
Cyberscience

Community
Science

Ecology &
biodiversity

Meteorology

Archaeology

Volunteer
computing

Volunteer
thinking

Passive
Sensing

Participatory
sensing

DIY Science

Civic Science



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Open Air Laboratories (OPAL)

The OPAL project, funded by the Big Lottery Fund, aims to (i) change lifestyles by encouraging people to spend more time outdoors; (ii) develop innovative educational programmes that can be accessed by all ages and abilities; (iii) enthuse a new generation of environmentalists; (iv) develop a greater understanding of the state of the natural environment especially in the most impoverished parts of the country; (v) develop partnerships between the community, voluntary and statutory sectors. 31 projects comprise the OPAL 'portfolio' to attain these aims. The OPAL Water Centre at UCL co-ordinated the national water survey and undertakes research at a lake site in each of nine regions of England. This research includes establishing a physical, chemical and biological monitoring programme and assessing the impact of toxic pollutants on freshwaters. Part of this involved assessing historical change through biological and geochemical analysis of sediment cores from each lake. The facility provided the sediment core chronologies.

Project web page: <http://www.opalexplornature.org/>

Davies, L., Bell, J.N.B., Bone, J., Head, M., Hill, L., Howard, C., Hobbs, S.J., Jones, D.T., Power, S.A., Rose, N.L., Ryder, C., Seed, L., Stevens, G., Toumi, R., Voulvoulis, N. & White, P.C.L. (2011). Open Air Laboratories (OPAL): A community-driven research programme. *Environmental Pollution* 159: 2203-2210.





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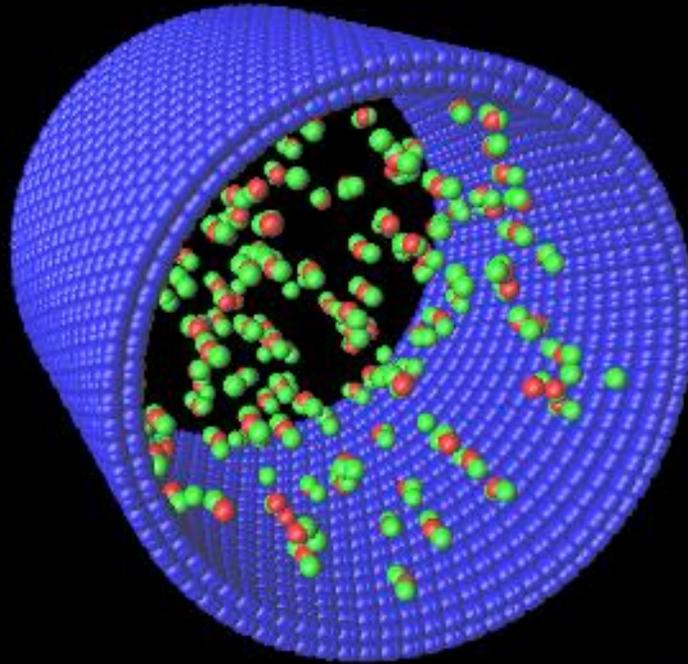
DIY Science

Civic Science



Volunteer computing

Computing for Clean Water 



Prog: 10.0%

 world community grid. technology solving problems

Powered by  



 Tasks 

 **FightAIDS@Home - Vina** 
World Community Grid
ready 75.0% 

Elapsed time: 04:03:30
Task Name: FAHV_x3NF6_B_IN_FBPb_rig_0205859_0382_8
Deadline: Sat 29 Mar 2014 07:10:29 pm

 **FightAIDS@Home - Vina** 
World Community Grid
ready 20.0% 

Elapsed time: 02:07:44
Task Name: FAHV_x3NF6_A_IN_Y3a_rig_0205304_2274_4
Deadline: Sat 29 Mar 2014 09:40:34 pm

 Computing will resume when battery charge reaches 90% (currently 73%)





2004

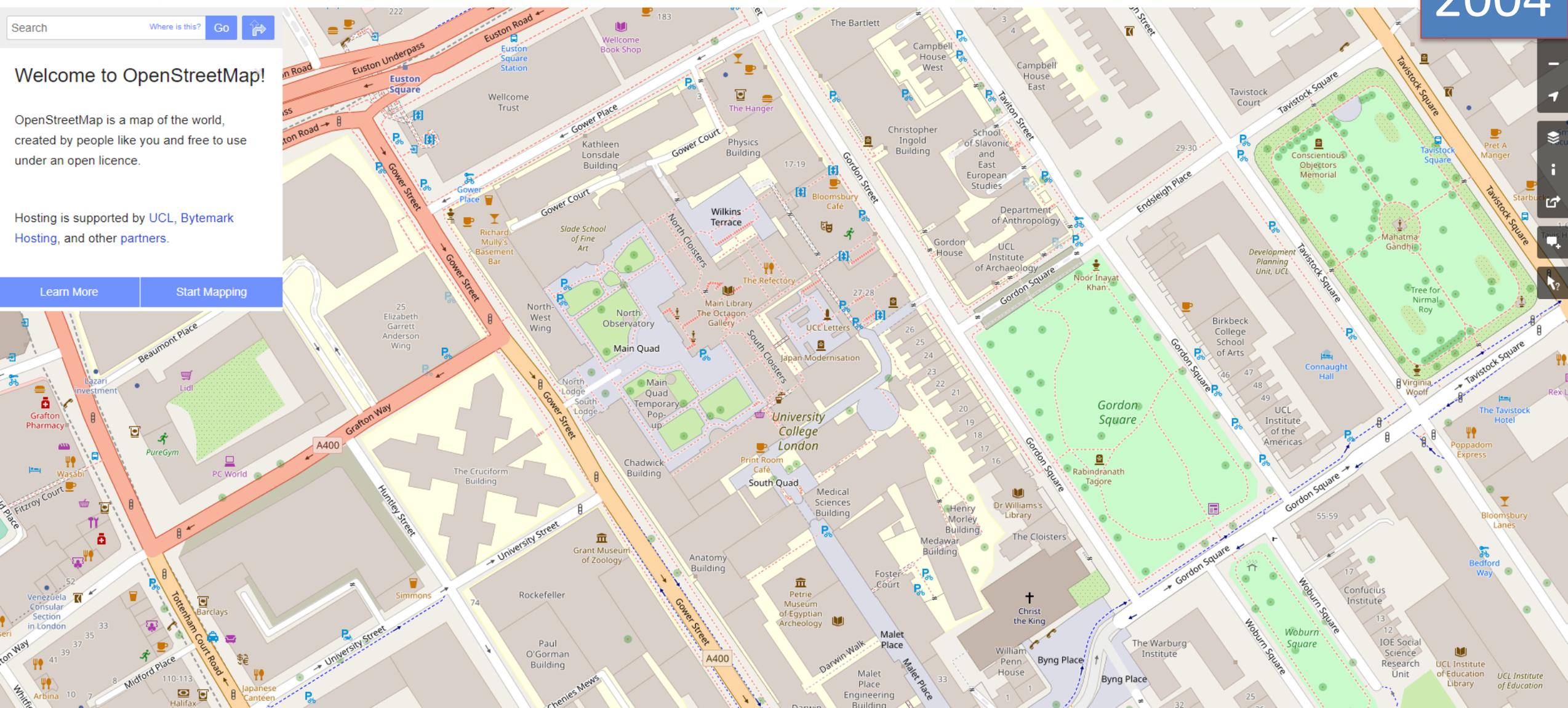
Search | Where is this? | Go | Home

Welcome to OpenStreetMap!

OpenStreetMap is a map of the world, created by people like you and free to use under an open licence.

Hosting is supported by [UCL](#), [Bytemark Hosting](#), and other partners.

[Learn More](#) | [Start Mapping](#)





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Welcome to Transcribe Bentham!

By uczwlse, on 6 December 2017



Jeremy Bentham

'Many hands make light work. Many hands together make merry work', wrote the philosopher and reformer, [Jeremy Bentham](#) (1748–1832) in 1793.

In this spirit, we cordially welcome you to *Transcribe Bentham*, a double award-winning collaborative initiative which is crowdsourcing the transcription of Bentham's previously unpublished manuscripts.

Anyone can start transcribing at our [Transcription Desk](#). Your transcripts will contribute to the production of Bentham's *Collected Works* and preserve Bentham's writings into the future.

Find out more about Transcribe Bentham in the sidebar menu on the left, or scroll down to read the latest news from the Transcribe Bentham blog.

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News

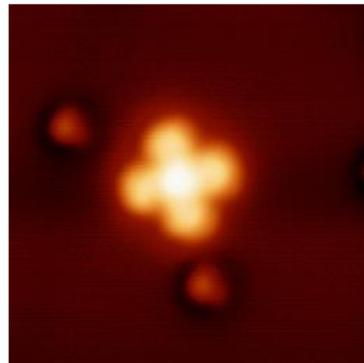
Events

Research highlights

Contact

Home / News & Events / Members of the public asked to help tend Feynman's Flowers

Members of the public asked to help tend Feynman's Flowers



Researchers at the London Centre for Nanotechnology (LCN) are asking members of the public to help unlock the secrets of magnetism at the molecular scale by taking part in a citizen science project entitled '[Feynman's Flowers](#)'.

The project's website will invite volunteers from across the world to analyse microscope images of individual molecules, which have characteristic flower shapes. Anyone can take part, and only a few clicks of the computer mouse are required to collect valuable information.

The Feynman's Flowers project will allow volunteers to measure the position of a molecule in relation to a metal surface to help scientists understand how this can affect the molecule's properties. Data that volunteers produce will contribute to a research project run by the group of [Dr. Cyrus Hirjibehedin](#) at the LCN, in collaboration with [Tsinghua University](#) in Beijing and the [Citizen Cyberscience Centre](#)*.

Currently, the research project is focused on exploring the behaviour of phthalocyanine molecules. In the past, these were used as dyes for fabrics, but scientists now realise that they also have interesting electronic and magnetic properties that make them potentially useful for creating nanoscale devices that can manipulate or store information.



Passive Sensing

- In passive sensing, participants download a software, and sometimes connect a sensor, to allow for a wide network of observation.
- Quake-Catcher provide detailed seismographic observations

QCN

HOME ABOUT QCN JOIN QCN NEWS LEARNING RESEARCH MY QCN/BOINC HELP DESK

Check out the new sensors!

The new O-NAVI sensors have been received and are ready to ship!

READ MORE

The Quake-Catcher Network

The Quake-Catcher Network is a collaborative initiative for developing the world's largest, low-cost strong-motion seismic network by utilizing sensors in and attached to internet-connected computers. With your help, the Quake-Catcher Network can provide better understanding of earthquakes, give early warning to schools, emergency response systems, and others. The Quake-Catcher Network also provides educational software designed to help teach about earthquakes and earthquake hazards.

SEARCH

LOG IN

Please use your BOINC account to sign in. If you don't have one, please

REGISTER!

Username

Password



BBC Pandemic experiment

2018





Citizen Science

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Urban Studies (1988), 25, 455–473
© 1988 Urban Studies

People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City

Jacquelin Burgess, Carolyn M. Harrison and Melanie Limb

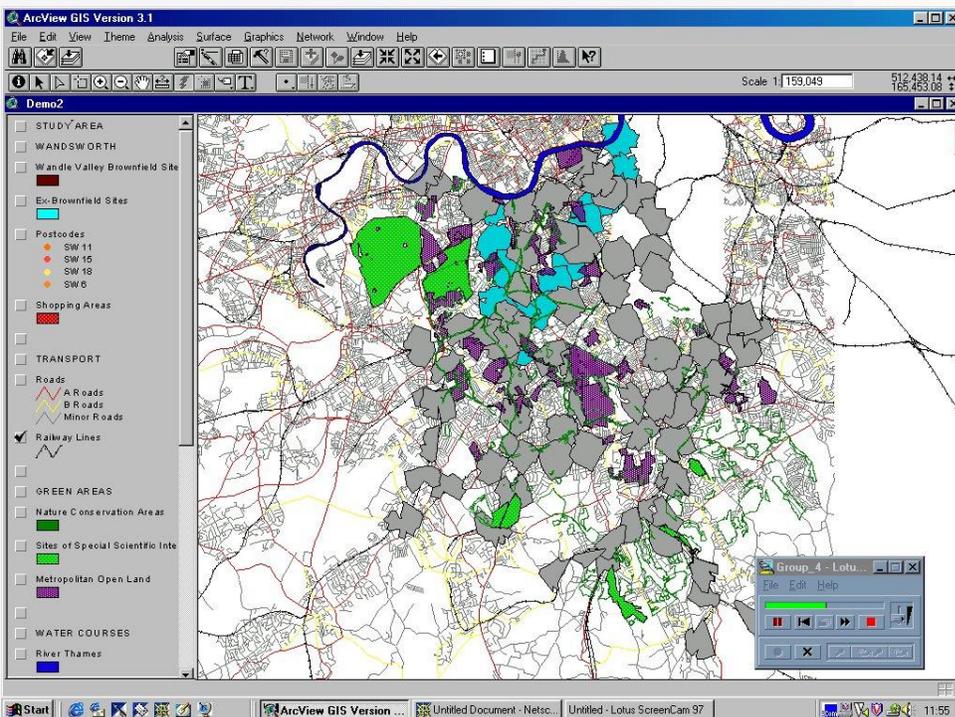
[First received, December 1987; in final form, June 1988]

Summary. Contemporary provision of open spaces within cities rests largely on professional assumptions about its significance in the lives of residents. This paper presents results from the Greenwich Open Space Project which used qualitative research with four, in-depth discussion groups to determine the design of a questionnaire survey of households in the borough. The research shows that the most highly valued open spaces are those which enhance the positive qualities of urban life: variety of opportunities and physical settings; sociability and cultural diversity. The findings lend some support to the approach of the urban conservation movement but present a fundamental challenge to the open-space hierarchy embodied in the Greater London Development Plan. The Project identifies a great need for diversity of both natural settings and social facilities within local areas and highlights the potential of urban green space to improve the quality of life of all citizens.



Working with communities

1998



Participatory Sensing



OdourCollect
392 Tweets

ODOUR COLLECT

Follow

OdourCollect
@Odourcollect Follows you

Mapping odours with #CitizenScience for citizens' empowerment. Smell and share!
Idea by @RosaAriasAlv developed by @ibercivis Seed and main tool of @dNOSES_EU

Barcelona, España odourcollect.eu Joined December 2016

428 Following 284 Followers

Followed by Citizen Science Global Partnership, CitSci TC, and 31 others you follow



[UCL Home](#) » [The Bartlett](#) » [UCL Institute for Global Prosperity](#) » "Rethinking what prosperity means for London": a new film for the London Prosperity Board

"Rethinking what prosperity means for London": a new film for the London Prosperity Board

15 March 2019

The Institute for Global Prosperity's London Prosperity Board has produced the short film, "Rethinking what prosperity means for London", presenting our work in East London and citizen science-led approach to research. Film credit: Matt Ballard



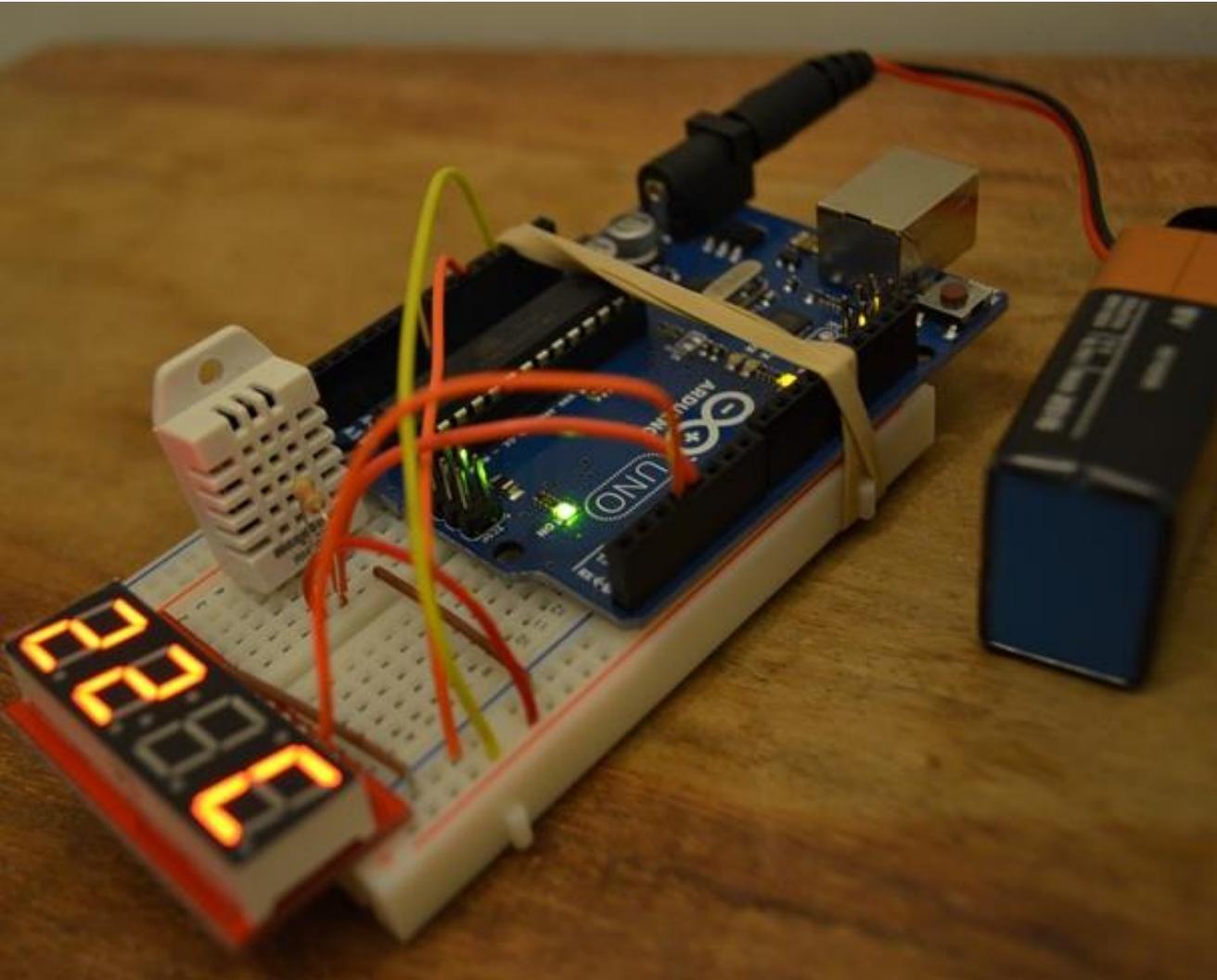
Visit the [London Prosperity Board website](#)



The London Prosperity Board is an innovative partnership between the Institute for Global Prosperity, UCL, London government, public agencies, businesses, the third sector, and local communities in East London.



DIY Science



Join the Flood Network Community



BECOME A FLOODWATCHER - KEEP AN EYE ON THE MAP

You don't need any fancy technology to become a Floodwatcher. You can take readings from gaugeboards or take photos and we can include them in our data. We're building a network of people and sensors around the country to monitor flooding at a local level.

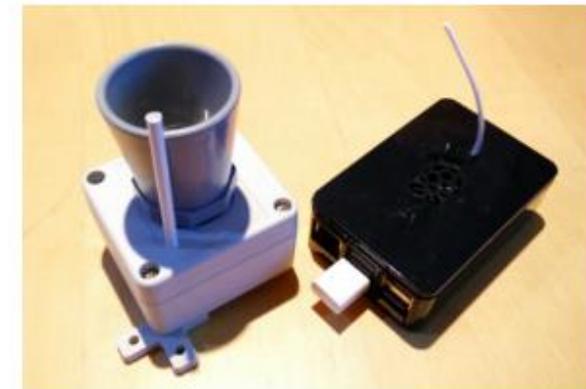
The information helps people to make better decisions during floods and quickly shares knowledge of a changing situation. We combine Environment Agency data with crowdsourced sensors in ditches, streams, drains and even under floorboards to give a near real-time picture of levels.

INSTALL A FLOOD MONITOR

Do you live within 40m of a river or stream and have broadband? Would you like to know water levels when you're not home? Flood Monitor contributes to the resilience of your community by sharing this information.

You can install a Flood Monitor and see your readings live on the map every 15 minutes. Flood Monitors (£250) are available to groups or individuals who'd like an unobtrusive, low-cost way of monitoring water levels and contributing this to a bigger community.

If you'd like a sensor then [email us](#) and we'll get in touch. We have a small supply of sensors to donate to community groups and individuals can buy one for £250.





Bento lab – DIY biology tool

2016

Buy

Take your lab wherever you go

The mobile genomics setup.
Combines centrifuge, PCR and gel visualisation.
Portable and ready-to-go.

Buy Now

Watch Video





Sapelli is an open-source project that facilitates data collection across language or literacy barriers through highly configurable icon-driven user interfaces. We encourage people to download the app from the [Google Play store](#), or from our [GitHub repository](#) and deploy it for their own purposes.

The sequence of interfaces that will be presented to the user in the project is described in the project's XML file. The transmission of complete records is handled autonomously by the Sapelli platform, which periodically checks for connectivity and determines the most appropriate means by which to transmit the compressed data to another phone or a [GeoKey](#) web server.

This website should help to get started with creating bespoke data collection apps that meet individual requirements.



Maasai Mara, Kenya





Science of Citizen Science

Designing for dabblers and deterring drop-outs in citizen science

Authors Alexandra Eveleigh, Charlene Jennett, Ann Blandford, Philip Brohan, Anna L Cox

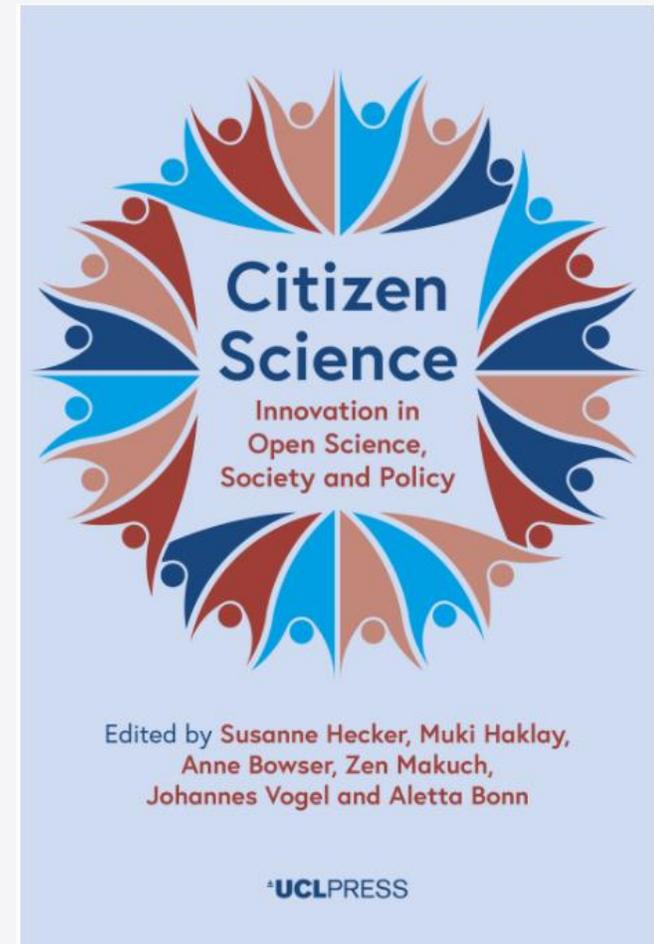
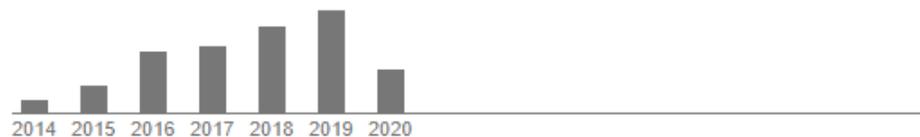
Publication date 2014/4/26

Book Proceedings of the SIGCHI Conference on Human Factors in Computing Systems

Pages 2985-2994

Description In most online citizen science projects, a large proportion of participants contribute in small quantities. To investigate how low contributors differ from committed volunteers, we distributed a survey to members of the Old Weather project, followed by interviews with respondents selected according to a range of contribution levels. The studies reveal a complex relationship between motivations and contribution. Whilst high contributors were deeply engaged by social or competitive features, low contributors described a solitary experience of dabbling in projects for short periods. Since the majority of participants exhibit this small-scale contribution pattern, there is great potential value in designing interfaces to tempt lone workers to complete 'just another page', or to lure early drop-outs back into participation. This includes breaking the work into components which can be tackled without a major commitment of time and ...

Total citations Cited by 167





UCL eXtend course



MyeXtend / My courses / Introduction to Citizen Science & Scientific Crowdsourcing / Welcome to Introduction to Citizen Science and Scientific Crowdsourcing

Introduction to Citizen Science & Scientific Crowdsourcing

Welcome to Introduction to Citizen Science and Scientific Crowdsourcing

Week 1: Introduction

Week 2: Scientific crowdsourcing principles and practice

Week 3: Environmental citizen science

Week 4: Citizen science data management issues

Week 5: User Experience for Citizen Science

Week 6: User Experience for Citizen Science II

Week 7: Legal and ethical issues; citizen science with non-literate participants

Week 8: Evaluation in a new light

Week 9: Disciplinary differences and policy

Week 10: Theoretical frameworks for citizen science

Over the past decade, **Citizen Science** has gained popularity as a new way to open up science to the public. Simply put, citizen science is the participation of people from outside the usual places where science is done - universities, governmental bodies, and research centres - in scientific projects.

Citizen Science engages new people in scientific projects, increase awareness of scientific issues and provide informal education about them. It also provides many new skills - in technology, science and community organisation, to name but a few. Scientific crowdsourcing can be considered as a part of citizen science, and relates to large-scale participation - sometimes with tens of thousands of people joining projects.

In this course, we will introduce you to the theory and practice of citizen science and scientific crowdsourcing.

This online course is running as part of a face to face module (with the same name) at the Department of Geography. The course, GEOG0152, is part of the Masters level option modules. Therefore the course will run over 11 weeks (with one week break, during week 6, coinciding with UCL's Reading Week). Each week, the course will include 2 lectures and practical assignments.





Citizen Science

Citizen Science

Citizen Science is members of the public having a greater role within research and recognising the invaluable role they play in providing insights a researcher may not typically have.

Citizen science is a common name for a wide range of activities and practices. It is possible to understand it by considering the characteristics of those activities and practices. Found in different scientific disciplines – from the natural sciences to the social sciences and the humanities – and within each discipline, the interpretation of citizen science can be slightly different. Yet despite these differences, citizen science is an emerging area of research and practice, with evolving standards on which different stakeholders are developing methodologies, theories and techniques – Adapted from “[ECSA's Characteristics of Citizen Science](#)”.

Harnessing the advantages of the internet, openly available software packages and local knowledge, citizen science brings about a change in the way research is conducted – no longer limited to academic researchers, it encourages active collaboration from groups across society, making members of the public fellow researchers.

Training and Resources

We would like to encourage everyone to consider taking a Citizen Science approach in your research. We have collated the following resources for you to look at, and you can always get in touch using the details on the right.

- UCL Short Course: [Citizen Science and Scientific Crowdsourcing: an Introduction](#)
- Online resources: [The ECSA Characteristics of Citizen Science](#)
- UCL Press: [Citizen Science: Innovation in Open Science, Society and Policy](#)
- [Citizen science at universities: Trends, guidelines and recommendations](#)

8 Pillars of Open Science

Open Science is underpinned by eight pillars and UCL is seen as a leader in Europe in Open Scholarship undertaking activity in all 8 areas. Its work is formulated in line with the recommendations of the [LERU Roadmap for Open Science](#), produced in 2018.

[Introduction to the 8 Pillars of Open Science](#)

Open@UCL Blog

[See the latest posts on our Blog](#)

News

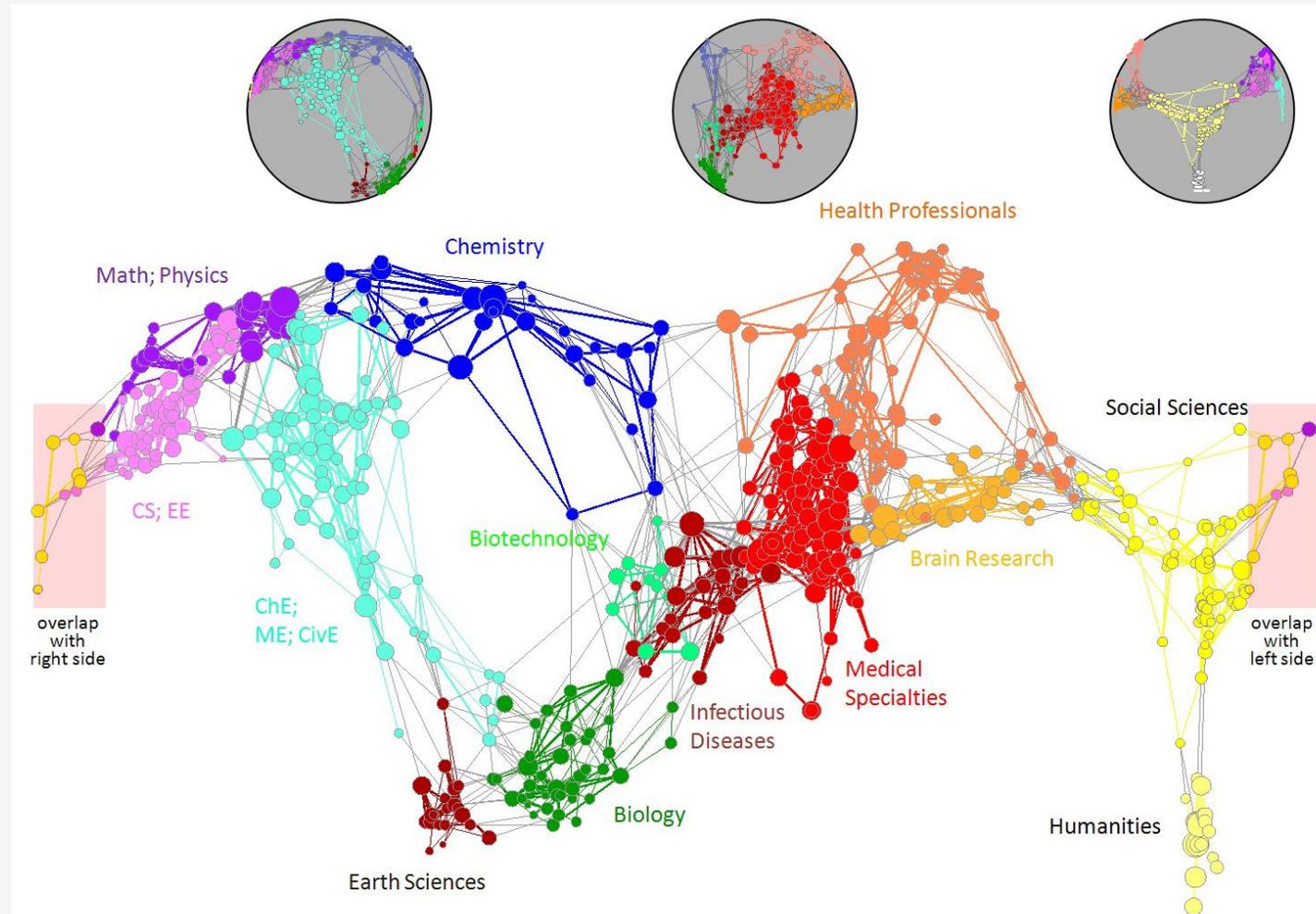
- [UCL bibliometrics policy](#) has been launched, which sets out principles for the use of citation metrics in research assessment across the university.
- UCL has signed the [Wellcome Statement on Open Data](#).
- A new [UCL Statement on the importance of Open Science/Scholarship](#) has been published in response to the coronavirus pandemic.
- [UCL Statement on Transparency in Research](#) has been published, which outlines

- UCL Office of Open Science & Scholarship (launched Oct 2020)



Crossing the spectrum

- Crossing disciplines
- Participants engagement
- Use of technology
- Time scales
- Levels of knowledge





Community of practice - associations

- (2012)-2014 – Citizen Science Association
- 2013 – European Citizen Science Association
- 2014 – Australian Citizen Science Association
- 2017 – African & Asian Citizen Science networks



CITIZEN SCIENCE
ASSOCIATION



EUROPEAN
CITIZEN SCIENCE
ASSOCIATION



Australian
Citizen Science
Association



Local networks emerging

- Across Europe, national networks emerging

Bürger schaffen Wissen
Die Citizen Science Plattform

Mitforschen Blog Citizen Science Über uns

Forum Citizen Science 2019

Jetzt anmelden zum Forum Citizen Science 2019!

Wir freuen uns, Ihnen dank vieler spannenden Einreichungen im Call das Programm für das Forum Citizen Science 2019 in Münster präse dürfen. Ab jetzt können Sie sich für das Forum anmelden. Wir freuen Teilnahme.

© Sergey Mukhametov

Zum Forum Citizen Science 2019 →

Citizen Science Portalen

Adminstreret af Citizen Science Netværket

FORSIDE OM PORTALEN NYHEDER PROJEKTER CITIZEN SCIENCE SYMPOSIUM 2019 VÆRKTØJSKASSE

Citizen Science Netværket

4. JUNI: STIFTENDE MØDE FOR DET DANSKE CITIZEN SCIENCE NETVÆRK

Kære alle, Vi vil gerne invitere til et stiftende møde for det danske citizen science netværk. Dette møde følger op på

CIENCIA CIUDADANA EN ESPAÑA

I FORO INTERNACIONAL #CC ÚNETE QUÉ ES EL OBSERVATORIO INICIATIVAS RECURSOS

Mapa de proyectos de Ciencia Ciudadana en España

Mapa: © OpenStreetMap contribuyentes

PROYECTOS

PERSONAS

INSTITUCIONES

1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding.
2. Citizen science projects have a genuine science outcome.
3. Both the professional scientists and the citizen scientists benefit from taking part.
4. Citizen scientists may, if they wish, participate in multiple stages of the scientific process.
5. Citizen scientists receive feedback from the project.
6. Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for.
7. Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format.
8. Citizen scientists are acknowledged in project results and publications.
9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.
10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.



Version 1, April 2020

ECSA's characteristics of citizen science

Introduction

Citizen science is a common name for a wide range of activities and practices. It is possible to understand it by considering the characteristics of those activities and practices, which are described in this document. These are found in different scientific disciplines – from the natural sciences to the social sciences and the humanities – and within each discipline, the interpretation of citizen science can be slightly different. Yet despite these differences, citizen science is an emerging area of research and practice, with evolving standards on which different stakeholders are developing methodologies, theories and techniques. It is, therefore, useful to establish some level of shared understanding, across disciplines and practices, as to what to expect from an activity or a project that is set out to be a citizen science one.



OPPORTUNITIES AND CHALLENGES



Citizen Science in research

- Co-production of knowledge
- Engagement and inclusion of voices that are missing from scientific research
- Coverage and scope
- Creating an impact
- Accessing resources that would be very difficult to reach otherwise



Policy awareness and impact



HOME · BLOG

Accelerating Citizen Science and Crowdsourcing to Address Societal and Scientific Challenges

SEPTEMBER 30, 2015 AT 6:00 AM ET BY TOM KALIL AND DAVE WILKIP



Summary: Today, the White House is hosting

While only a fraction of Americans are formally trained to contribute to science, engineering, and technology through citizen science and crowdsourcing projects.

Citizen science encourages members of the public to volunteer by asking questions, making observations, conducting experiments, developing technologies and open-source code, members of the public contribute to the scientific process.

Through **crowdsourcing** - an open call for voluntary assistance to study and tackle complex challenges by conducting research and study in ways that professional scientists working alone could not. For example, understanding the structure of proteins related viruses is possible through [preparing for, responding to, and recovering from disasters](#).

114TH CONGRESS 2D SESSION **H. R. 6414**

To encourage and increase the use of crowdsourcing and citizen science methods within the Federal Government to advance and accelerate scientific research, literacy, and diplomacy, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 30, 2016

Mr. TONKO (for himself, Mr. MCKINLEY, and Mr. KILMER) introduced the following bill; which was referred to the Committee on Oversight and Government Reform

A BILL

To encourage and increase the use of crowdsourcing and citizen science methods within the Federal Government to advance and accelerate scientific research, literacy, and diplomacy, and for other purposes.



Whenever possible, **citizen science** should be encouraged, where citizens become providers and users of data. This will reinforce and give new meaning to the policy of open access to publications and data; this openness should enable citizens and citizen groups to participate in evidence-based policy and decision-making. This could give rise to new types of partnerships, such as “P4P”s or “P4.0s” where “people” are working together with the public and private sector. This could be systemically implemented on European, national and regional levels.



Horizon Europe

Cross-cutting elements

Horizon Europe will significantly **strengthen international cooperation** which is crucial to ensure access to talent, knowledge, know-how, facilities and markets worldwide, to effectively tackle global challenges and to implement global commitments. The Framework Programme will intensify cooperation and extend association agreements to include countries with excellent science, technology and innovation capacities. The Programme will continue to fund entities from low-to-mid income countries, and to fund entities from industrialised and emerging economies only if they possess essential competence or facilities.

The principle of open science will become the modus operandi of the new Programme. It will go beyond the open access policy of Horizon 2020 and require open access to publications and data (with robust opt-outs for the latter), and to research data management plans. The Programme will foster the widespread use of FAIR (findable, accessible, interoperable, and re-usable) data; and activities that enhance researchers' skills in open science and support reward systems that promote open science. Research integrity and citizen science will play a central role, as will the development of a new generation of research assessment indicators.

CITIZEN SCIENCE ELEVATING RESEARCH & INNOVATION THROUGH PUBLIC PARTICIPATION



Interaction between citizens, scientists and policy makers is essential to enrich research and innovation, and reinforce trust of society in science. I am proud of the hundreds of thousands involved citizens that already contributed to research and innovation and look forward to continue opening up research towards society and the world.

Mariya Gabriel Commissioner for Innovation, Research, Culture, Education and Youth

WHAT IS CITIZEN SCIENCE AND WHY IS IT IMPORTANT?

Citizen science can be described as the **voluntary participation of non-professional scientists in research and innovation** at different stages of the process and at different levels of engagement, from shaping research agendas and policies, to gathering, processing and analysing data, and assessing the outcomes of research.

Active engagement with citizens and society has the potential to **improve research and its outcomes and reinforce societal trust in science**. It can increase

- **relevance and effectiveness** by ensuring that R&I aligns with needs, expectations and values of society
- **creativity and quality** by enlarging the collective capabilities, the scope of research and the quantity and quality of data
- **transparency, science literacy and confidence of the public in research**

CITIZEN SCIENCE AS PART OF EU POLICY

Citizen engagement is at the core of the Von der Leyen Commission's **New Push for European Democracy** and more participatory decision-making, and an **integral part of the EU's Open Science policy priority and the European Research Area**.



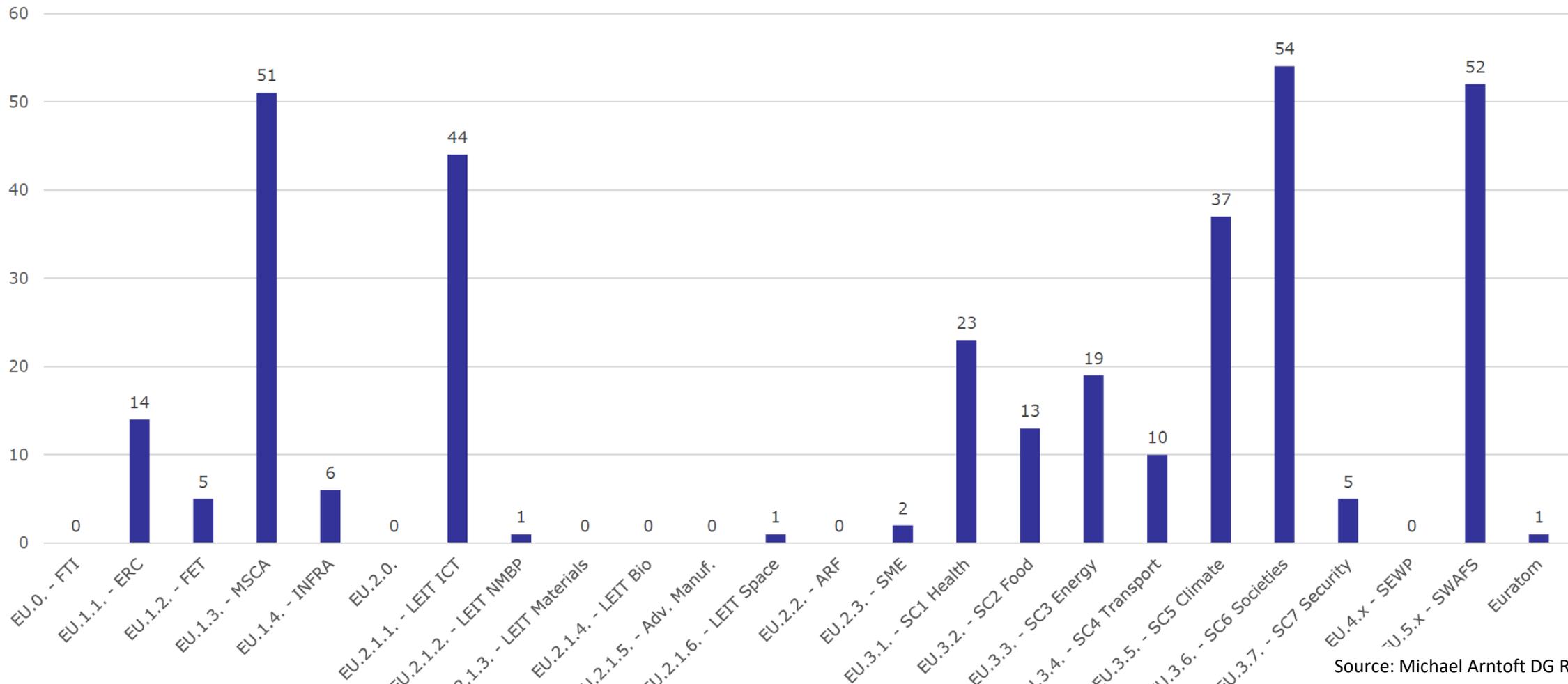
HORIZON EUROPE

The Horizon Europe Programme will reinforce interaction between science and society by promoting the co-creation of R&I agendas and by involving citizens and civil society directly in 'doing' research and innovation. It will do so across the Programme and through dedicated activities, while monitoring citizens' contributions and the uptake of R&I in society.



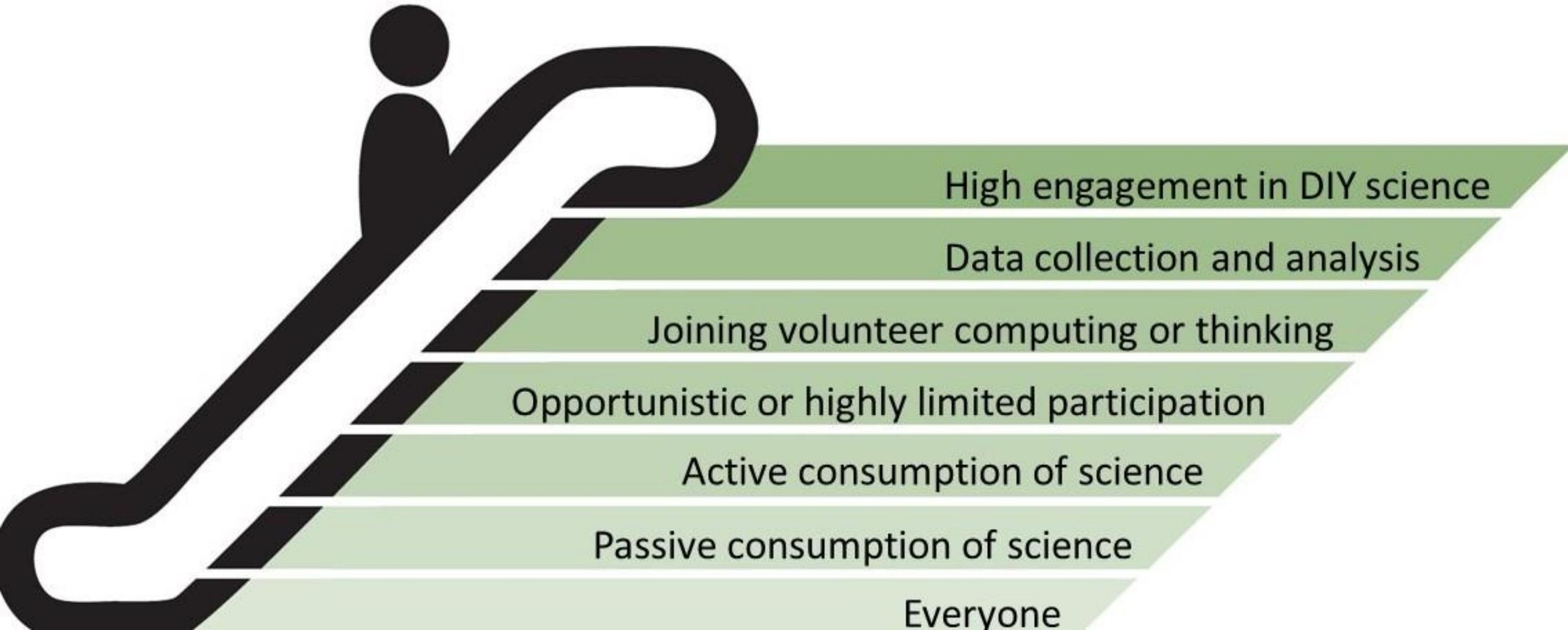
Citizen Science Activities in Horizon 2020

Number of projects involving citizen science activities by H2020 part (total: 338)





Citizen Science with public engagement





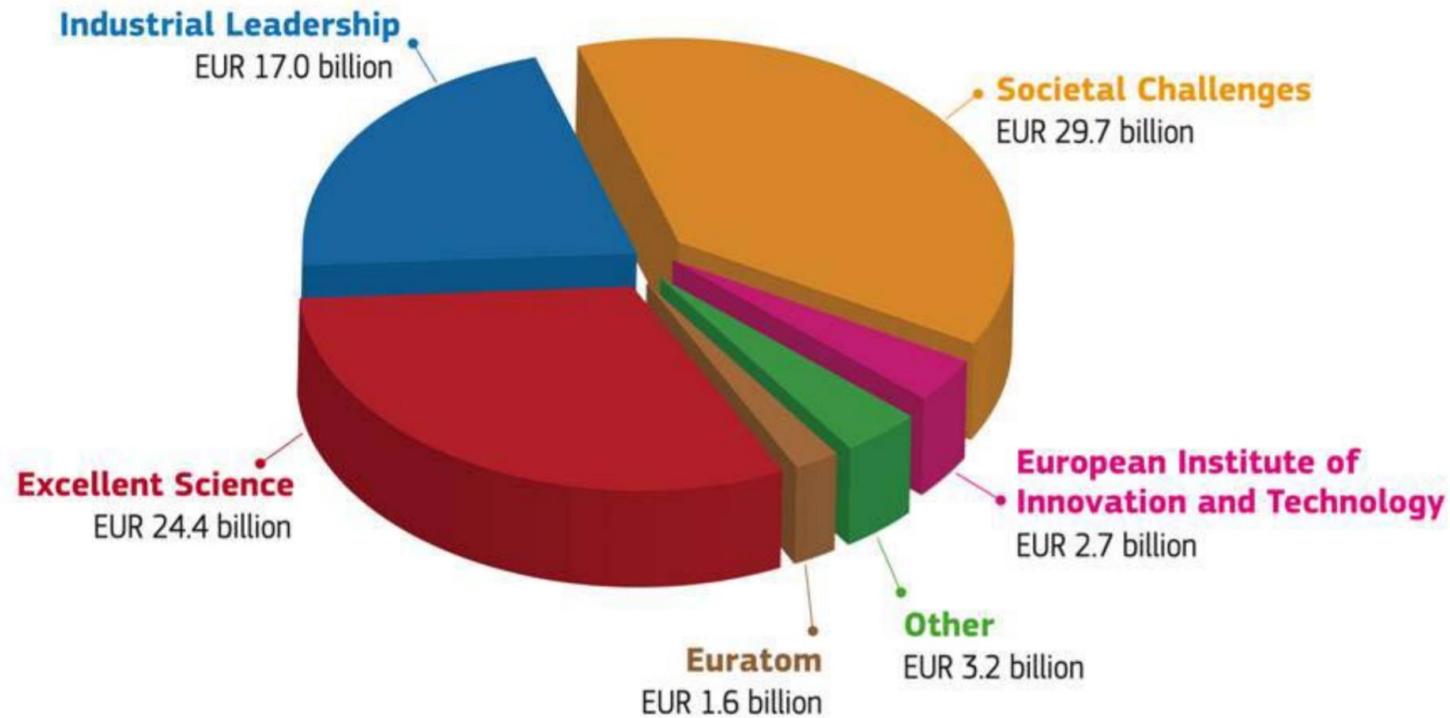
The challenge: Citizen Science goals

- Each citizen science project is a balancing act between the scientific goals, scale and depth of engagement, benefits to different stakeholders (scientists, participants, project funders)





HORIZON 2020 BUDGET (EUR 78.6 billion, current prices)



Science with and for society	0.60%	462
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Citizen science & universities

- Enables research that is not possible otherwise
- Addresses the need for societal impact
- Contribute to all the missions: teaching, research, outreach
- Crossing all disciplinary boundaries: support to it is part of the university infrastructure (hence libraries as a potential host)