Imagining sustainable just futures: The role of science communication

Betzabe Torres Olave & Lucy Avraamidou
University of Leeds, UK / University of Groningen, Netherlands
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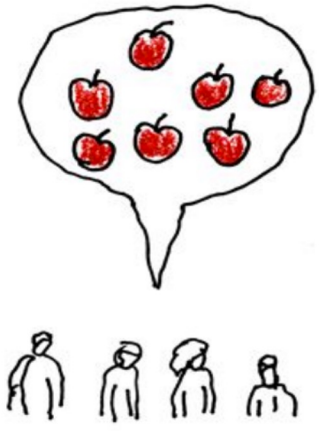
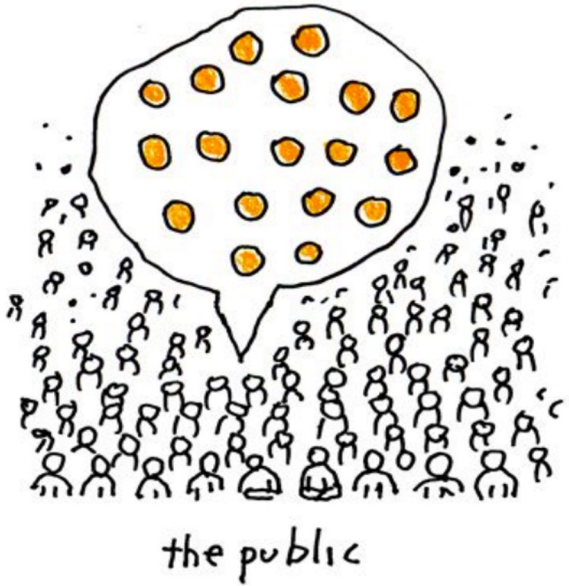
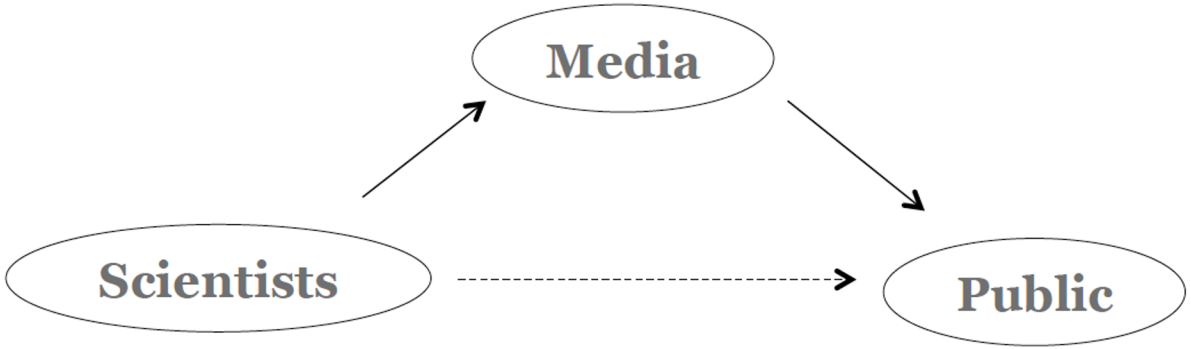
STAGE
scientists and public engagement

- What is science communication?
- Research interest: justice-oriented science
- Public engagement with science and its pedagogies
- Short activity to think together
- Some guiding principles for us
- An example from current practice: STAGE
- An invitation

Science communication






Media
Scientists
Public

WHY?

To increase appreciation for science as a useful way of understanding and navigating the modern world

To increase knowledge and understanding of the science related to a specific issue

To influence people's opinions, behaviour, and policy preferences

To engage with diverse groups so that their perspectives about science related to important social issues can be considered in seeking solutions to societal problems that affect everyone

WHERE?

TV, newspapers, magazines, the radio

Social media (inc., Youtube, Facebook, Twitter, blogs, podcasts)

Science festivals; art + science events

Science centres, museums, zoos, botanical gardens, etc

TED-talks, conference presentations

Famelab competition, ‘dance your PhD’ competition etc

- https://www.youtube.com/watch?v=lxMvH6C1aXs


SN
SCIENCE NEWS MAGAZINE
SOCIETY FOR SCIENCE & THE PUBLIC
MARCH 4, 2017
Neutron's Elusive Lifetime
Species Miscounts
How Frogs Spit and Splat
Next-Gen Catalysts
CANCER
Fights Back
Tumor response to oxygen starvation forces scientists to seek new strategies

THE WORLD'S FIRST SOLAR PANEL ROAD!

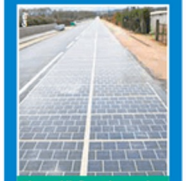
A VILLAGE in Normandy in northern France has opened what it says is the world's first solar panel road.

The 1km (0.6-mile) street is in the village of Tourouvre-au-Perche, which has just 3,400 residents. The road has been covered with 2,800m² of panels that use the sun's energy to generate electricity. The road is called Wattway and was opened late last month by France's ecology minister, Ségolène Royal.

The road cost €5 million (£4.2 million) to build. It's thought that around 2,000 drivers will use it every day during a two-year test run. The electricity generated by the solar panels will be used to provide power for street lighting in Tourouvre-au-Perche.

If the trial is successful, Ms Royal wants more roads in France to use solar panels.

There is one slight problem, however: Normandy doesn't get a great deal of sun! The capital city of the region, Caen, enjoys just 44 days of strong sunshine a year.



The world's first solar panel road in Normandy, France

ONLINE store Amazon wants to create massive flying warehouses filled with fleets of drones that can deliver goods. The warehouses would be carried by airships that hover at altitudes of up to 14,000m (45,000ft).

EARTH 2016

Sunset at Mount Fuji in Honshu, Japan

Thunderstorms over the Philippine Sea

The Luiz Gonzaga Reservoir in Brazil

by Eddie de Oliveira

IT hovers above us, orbiting Earth once every 90 minutes at a speed of 7km per second. It's a giant laboratory in space, home to astronauts who are carrying out scientific tests.

But it turns out that the International Space Station (ISS) is also a pretty cool place to take awesome photos of Earth! From a height of more than 400km (250 miles), the world can sometimes look more like an alien planet than the place we call home. Staff at space agency NASA in Houston, USA have picked their top photos of Earth taken by astronauts on the ISS in 2016. Pictured above are just three of the 16 on the shortlist.

IGLOO ON MARS

NASA has announced plans to house the first astronauts on Mars in large inflatable igloos.

NASA plans to send the first men and women to Mars in the 2030s. To give the astronauts shelter and protection from extreme temperatures and cosmic rays that can damage human cells, scientists have come up with the idea of using robots to build igloos before the first humans arrive.

The igloo could house astronauts for months at a time

The Mars Ice Dome would be inflated by robots on the red planet. They would then create a thick shell of ice in the igloo's ceiling by taking water ice from beneath the planet's surface. This ice would be pumped into the dome's casing, and carbon dioxide gas would provide a layer of insulation between the living space in the igloo and the ice shell. Like water, carbon dioxide is available on Mars. The ceiling shell would protect the humans inside from the dangerous radiation on the planet's surface.

COSMIC dust has been found on rooftops in Paris, Oslo and Berlin. Researchers found 500 tiny cosmic dust grains, which is the first time that space dust has been found in city dirt. The particles are around 4.6 billion years old and date back to the birth of the solar system!

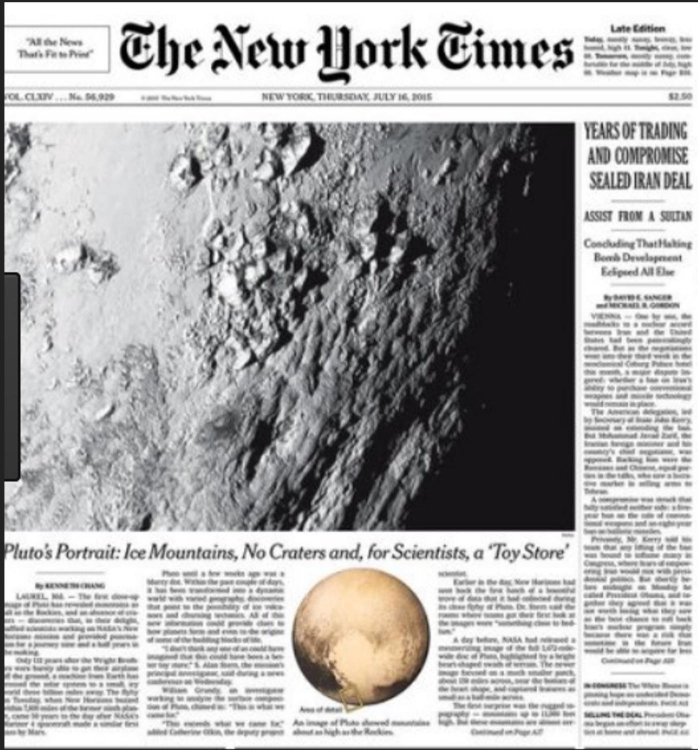
MONKEY TALK

EXPERTS at Princeton University in America reckon that monkeys have the ability to form sentences and speak – but lack the brain power to do it.

A team of scientists found that, just like humans, monkeys have the anatomy (body structure) to produce the five basic vowel sounds: a, e, i, o and u. These sounds are the basis of most human languages, including English, and are formed by the 'vocal anatomy'. That means our tongues, lips and the larynx, which is an organ in the neck that contains our vocal cords.

Although monkeys have a similar vocal anatomy, they don't have the "brain circuitry" to produce language and communicate with one another. The findings show that human speech comes mainly from the evolution and construction of our brains, rather than our physical ability to make sounds.

A Princeton professor said: "Monkeys have a speech-ready vocal anatomy, but not a speech-ready brain. Now we need to find out why the human but not the monkey brain can produce language."



"All the News That's Fit to Print"

The New York Times

Late Edition

VOL. CLXIV . . . No. 56,929 — NEW YORK, THURSDAY, JULY 16, 2015 — $2.50

Pluto's Portrait: Ice Mountains, No Craters and, for Scientists, a 'Toy Store'

By KENNETH CHANG

An image of Pluto showed mountains about as high as the Rockies.

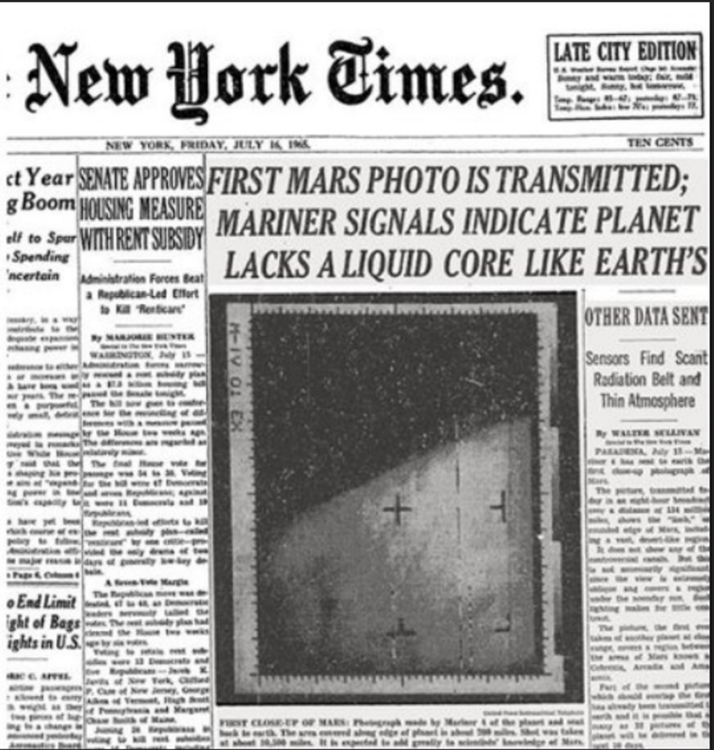
Area of detail

YEARS OF TRADING AND COMPROMISE SEALED IRAN DEAL

ASSIST FROM A SULTAN

Concluding That Halting Bomb Development Eclipsed All Else

By DAVID E. SANGER and MICHAEL R. GORDON



The New York Times.

LATE CITY EDITION

NEW YORK, FRIDAY, JULY 16, 1965. — TEN CENTS

FIRST MARS PHOTO IS TRANSMITTED; MARINER SIGNALS INDICATE PLANET LACKS A LIQUID CORE LIKE EARTH'S

SENATE APPROVES HOUSING MEASURE WITH RENT SUBSIDY

Administration Forces Beat a Republican-Led Effort to Kill 'Rentsupp'

By MARJORIE HUNTER

OTHER DATA SENT

Sensors Find Scant Radiation Belt and Thin Atmosphere

By WALTER SULLIVAN

FIRST CLOSE-UP OF MARS: Photograph made by Mariner 4 of the planet and sent back to earth. The area covered along edge of planet is about 700 miles. Shot was taken at about 10,500 miles. It is expected to add greatly to scientists' knowledge of Mars.

Donald J. Trump
@realDonaldTrump

Following

Give me clean, beautiful and healthy air - not the same old climate change (global warming) bullshit! I am tired of hearing this nonsense.

RETWEETS	LIKES
336	366

1:44 AM - 29 Jan 2014

Studium Generale GRONINGEN

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DE MELODIE VAN DE NATUUR
IVO VAN VULPEN

PROGRAMME

IMAGING SCIENCE

IN THIS SERIES
Kenniscafé Groningen 2017

Thursday 23 November 2017
Kenniscafé Groningen 2017

IMAGING SCIENCE
Science Café

Marcus Lyon, Otavio Schipper, Lucy Avraamidou a.o.

Artists often ask themselves the same questions as scientists and share many of the same principles: originality, creativity and an open mind. For photographers and artists, science is a subject as well as a source of inspiration. How can artists capture abstract science in an appealing and aesthetic way?
Can they surprise scientists and the broader audience with their imagination? The Noorderlicht International Photography Festival 2017 is about science and the representation of it by photographers and artists: NUCLEUS, imagining science. In this Science Café, artists and scientists will enter into a dialogue with one another.

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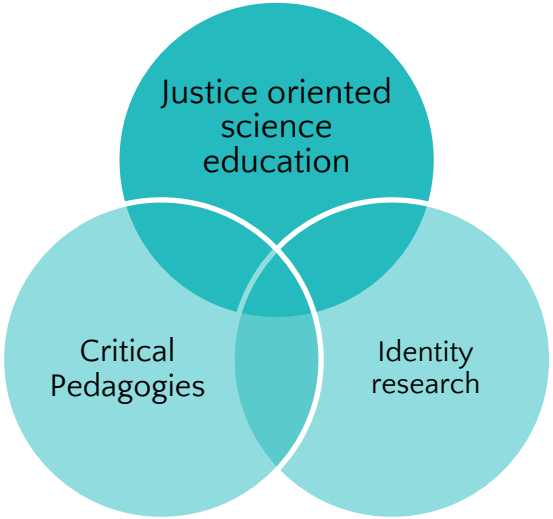
results
training
target
learning
student
students
web2.0
discussion
voice
text
newspaper
dialogue
message
abstract
theatre
radio
speaking
practicing
researcher
activities
thoughts
article
tv
journals
posture
introduction
improvisation
stage
organize
oral
scientific
PhD
blog
doctoral

Justice in/through science education is beauty for us



How we imagine…

Who we could be…?
What the world could be…?
What science education could be…?
What justice look like…?

Different calls for justice-oriented science and education

- “The task before us is to strengthen a shared, ongoing global dialogue about **what to take forward, what to leave behind and what to creatively reimagine in education and the world at large”** (UNESCO, 2022, p.15)
- Current educational system works as a “desimagination machine” (Giroux, 2021), reproducing notions of the world that put certain knowledges at the centre, resulting in unsustainable, exploitative and marginalising notions of science.
- There is a need for a more action oriented, socio-politically and ecologically rich science education (Wallace et al., 2022) and communication (Pedretti & Navas Iannini, 2020).

Different calls for justice-oriented science and education

How to reimagine science education?
How can imagination for sustainable just futures be cultivated?

Who is a science educator/communicator?
What pedagogies do they engage with?

How to reimagine science education?

Contesting the desimagination machine through ***pedagogies*** that expand what counts as science education (which has implications for its strong boundaries, and who and what is considered ***educating in science***)

Public engagement with science

Public engagement with science

It has many forms: popular science magazines, newspapers, websites, social media, TV, radio, TEDx talks, science festivals, etc.

However…

These experiences cannot be taken for granted.
They do not happen in a vacuum from neutral perspectives

Social justice questions need to be brought to the ***pedagogies*** involved in public engagement with science in general

Critical studies in public engagement with science have emphasised:

- It connects science with real world challenges rather than just description
- It can open opportunities to go beyond theories in their interlink with practice (praxis approach)
- It encourages new pedagogical approaches for wider public beyond schooled subjects

Pedagogies

- Pedagogy is “breaking through, transgressing, disrupting, displacing, inverting inherited concepts and practices” (Alexander, 2005, p.7) and that can be done not only in the context of schooling.

- Pedagogies are also understood as the **diverse ways we teach the world through different agents** that can be either institutionalised or through any public domain (Giroux, 2002).

Public pedagogies: a critical pedagogy framework

- Public pedagogies examine how different sites of practice work *pedagogically*
- These sites can either contest or reproduce the disemagination machine.

Public pedagogies seek to make the *political* more *pedagogical*

The Guardian

Big oil uncovered

Shell called out for promoting fossil fuels to youth via Fortnite game

Climate activists condemn oil giant for paying influencers to showcase marketing game from new gasoline campaign

Desimagination

- **Challenging the desimagination machine is an urgent task** to reclaim science education & communication to imagining other ways of living that are not exploitative, marginalising, and unsustainable.
- But, how to? What is the role of science communication on this?

Let's think together

Amidst the climate crisis:

- How can science communication contest the desimagination machine?
- What pedagogies are present/absent in science communication?

https://www.menti.com
Code: 7683 8170

By providing spaces where people can reflect on:

How do we live?

How have we lived?

How shall we live?

What alternatives might we imagine with/through science?

Engaging in meaningful, critical and world-transforming science discussions requires our justice-oriented **imagination.**

Such engagement and imagination, implies new relationships through and with science that are temporal, geographical, political.

By providing spaces where we consider:

Science in
and with context

For a diverse public
which are also experts

What pedagogies does that entails?

Pedagogies moving beyond teaching the content to making socio-political world issues, more pedagogical: appealing to intellect and sensibilities.

How can that happen?

Chilean microbiologist and science communicator Dr Cristina Dorador

Participated in writing an ecological constitution for the country. Active member of network of women in science and scientist for the right to water.

She has been working on decentring what counts as science in context (bring the value of deserts as not empty spaces through interdisciplinary dialogues)

She is working on making climate justice *issues* more pedagogical by bringing climate justice *questions* to public spaces (i.e., open talks, newspapers, school visits) through her academic work.

What pedagogies are present in science communication?

TAPUYA: LATIN AMERICAN SCIENCE, TECHNOLOGY AND SOCIETY
2021, VOL. 4, 1968634
https://doi.org/10.1080/25729861.2021.1968634

Routledge
Taylor & Francis Group

THEMATIC CLUSTER: ENDS IN OTHER TERMS

OPEN ACCESS Check for updates

Endangered *Salares*: micro-disasters in Northern Chile

Cristóbal Bonelli[a] and Cristina Dorador[b]

[a]Anthropology, University of Amsterdam, Amsterdam, Netherlands; [b]Department of Biotechnology, Universidad de Antofagasta, Antofagasta, Chile

ABSTRACT

This article emerges from a transdisciplinary collaboration between a micro-biologist and an anthropologist deeply concerned with the protection of endangered *salares* (saltpans) in northern Chile. Our aim is to establish the concept of "micro-disaster" as a tool for examining how extractivism is disrupting *salares* and their "deep-time" microbial ecologies. These ecologies are key for understanding early events on Earth, as their evolution enabled the oxygenation of the planet 2.5 billion years ago and caused the biodiversity explosion. By considering how *being human* involves *being microorganismal* – and how human time is entangled with microorganismic time –, this article connects neoliberal extractivist history with geo-biological evolutionary history. "Micro-disasters" therefore affect us deeply as complex humans, and oblige us to develop further a planet-centered mode of collaborating, thinking, feeling, and acting. In the context of this special issue on extinction, we insist that concerns over extinction must be considered in continuity with deep-time ecologies. We propose to rethink humans as an "environmentally complex we" simultaneously entangled with historical experiential time and microbial "deep-time."

KEYWORDS
Atacama Desert; Transdisciplinarity; saltpans; microbial ecologies; extractivism; deep-time; survival

PALAVRAS-CHAVE
Deserto do Atacama; transdisciplinariedad; salinas; ecologias microbianas; extrativismo; tempo profundo; sobrevivência

PALABRAS CLAVE
Desierto de Atacama; transdisciplinariedad; salares; ecologías microbianas; extractivismo; tiempo-profundo; sobrevivencia

"Our goal in this article has been to offer a conceptual experimentation capable of opening up new possibilities for communication and imagination **among affected bodies**" (Bonelli & Dorador, 2021, p.25)

- Including more than human others in the imagining of new sensibilities when searching for alternative and fair ways of living.
- Working across disiciplines
- Science communication bridging her science and society work

Guiding principles and questions for justice-oriented science engagement

- Imagination for what? Sustainable futureS for justice-oriented science
  - *How this project represents and work with different contexts? How those contexts have a say in what is being communicated/explored?*
- Plurality unfolds in disciplines dialoguing with each other
  - *What disciplines are at the core? How? Who is considered a valid communicator of science?*
- Decentring humans, and top-down approaches
  - *What is being communicated? What is at the centre? What pedagogy is being used to communicate? Who is mediating it? Who is silence?*

An invitation

- What is your project, lesson, activity saying about science, technology, and society?
- Whose society, whose technology? With(out) whom? For whom?
- What are your assumptions about others? Who is an expert? Who counts as science communication?
- What space you give to other disciplines, expertise, and notions of presents and futures when communicating science? Is it science at the centre or in dialogue with other disciplines?

Justice-oriented science engagement can help us to imagine sustainable and socially just futures. By constantly asking our science work to answer these questions we can push its conventional practices and challenge the desimagination machine