

Title slide

- Title: science communication more friendly towards visually impaired
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- Presented at: 20th IPPOG meeting
- Special note: today 3rd December is an international day for persons with disability

Slide 1: A blank black slide

- Narration: what you see on this slide is our Universe. It has stars and galaxies and many interesting phenomena.

Slide 2: obstacles with current scicomm strategies

- ... that is how scicomm appears for a VI/blind person
- Current science communication heavily relies on visual cues
 - Plots, charts, animations
- Takes many things for granted (highly non-trivial assumption)
 - Look up in the night sky, what do you see, stars and galaxies...
 - (Corona virus): Under the microscope, the viruses look like they are covered with pointed structures that surround them like a corona, or crown. ([JHU article](#))
- Examples above are inherently related to presence of a picture or a mental image
 - How does a galaxy look like? Are stars in the sky spread all over or concentrated in a single corner?
 - Is the virus a circle or a sphere or a box?
- VI community can be out of reach if scicomm relies heavily on pictures and uses language which depends on experiences of able bodies individuals

Can we create a scicomm narrative that depends on everyday tactile analogies?

Slide 3: Science communication

- Science communication: the art of explaining (at times complex) scientific concepts to wider audience
- Aims of science communication:
 - Create awareness
 - Create interest/curiosity
 - Educate others about your area of expertise
- We are not born scientists, we become scientists with our curiosity, tenacity and resources offered to us
- I am a scientist today because I went to night sky observation sessions organised free of cost. I am a scientist because someone communicated science to me in a way I could understand and appreciate it. In addition, I had the opportunity to ask questions.

Science communication can and will happen even if communicators are not present in person (written media)

Slide 4: science communication for VI - a personal journey

- Topic of a deep personal interest as my father is blind
 - He connects circuits and explained them to me literally in the dark
- He visited CERN in 2017 along with me and my mother
- Were given almost a VIP access to
 - CMS P5 (thanks Maria Cepeda),
 - SM18 (thanks Claire Adam-Bourdarios),
 - LHC data centre (thanks Andreas Wagner)
 - Thank you Claire for organising everything
- (As I understand) such visits generated a lot of behind the scenes discussion about VI accessibility at CERN and subsequent changes in microcosm

“From here we were taken to another unit in CERN where I could touch and get some idea of huge magnets. I could touch the area from where the particles actually pass. They are huge round shapes arranged in layers like an onion with insulation. I could also feel the cables connecting them.”

Mr. Chandrashekar Kulkarni (my father)

- Tactile resources work, must continue building them and making them available

Slide 5: Microcosm made accessible

- The slide shows some of the prototype exhibits created during IdeaSquare accessibility workshop which were later installed in microcosm in final version.
- The exhibits include a face on cut of a generic LHC detector printed in tactile form.
- Another exhibit includes actual detector components stuck on top of picture of the CMS detector which could be felt and understood.

Slide 6: current efforts in the community and new directions

- Multiple existing efforts for building tactile resources
 - Tactile Collider (<http://tactilecollider.uk/>)
 - Tactile Universe (<https://tactileuniverse.org/>)
- Alternative multi sensory efforts
 - Data sonification (<https://www.frontiersin.org/articles/10.3389/fcomm.2020.00046/full>)
 - Used also by professional VI astronomers (<https://fm4.orf.at/stories/2987076/>)
- Need to continue building on these dedicated resources
- Our aim: how do to make scicomm efforts more inclusive such that we can complement targeted outreach?
- Advantages:
 - Does not rely on availability of resources
 - Does not need 'maintenance'
 - Can reach anyone irrespective of their geographic location
 - Gives a better perspective over scientific concepts for everyone

How can we create 'frugal' science communication strategies which are more inclusive?

Slide 6: project concept and participants

- Aim: to develop a series of examples and a set of recommendations for making science communication more friendly towards VI community
- Participants: few professional science communicators and few members of VI community (completely blind)
- We meet once every two weeks and discuss with the help of concrete examples ways to achieve a more inclusive scicomm strategy

- Project started in September 2020 (during pandemic, all meetings are online)
 - We do not have any possibility of explaining in person
 - No access to advanced studio setup, written media or simple audio recording is the only possibility → no multi-sensory equipments
 - Created a unique opportunity to create written accessible science communication

A diverse group of people to create diverse strategies and devise pathways

Slide 7: output so far

- Each of us have taken a topic to understand how we can achieve this goal
- Topics handled so far
 - Dark matter (by Suchita Kulkarni, inputs by Sezen Sekmen)
 - Corona Virus (by Rafikh Shaikh)
 - Why does a mosquito bite? (by Kollegala Sharma)
 - Yellow-throated bulbuls - can they be a flagship model for the dry scrub forests of South India? (by Somdatta Karak, upcoming)
- We have recordings our meetings where we discussed each of the articles (yes there were iterations, not everything we did started out as perfect)
- Email exchanges which generated a LOT more (non-trivial) questions
- We will release all this material in due time such that it can be accessible for everyone without any barriers

Slide 8: output so far - II

- Shows that once accessible, there is a huge interest in science from everyone
- Some take away messages
 - Making scicomm inclusive benefits everyone not just a specific subsection (every one of us, who participated in making science communication accessible understood things more clearly for ourselves)
 - Accessible science communication does not need mean 'simpler' science communication, presence of complicated storylines are welcome so long as there are 'tactile' parallels
 - Every one of us sees the world differently, that diversity should be understood and used more

Slide 9: some examples

- Create your own galaxy
 - Take a bucket of water, put your hand in it and move the water in a circular direction. This creates a centre vortex and circularly moving water, that's how a galaxy looks like
 - Put ping pong balls in the water, they concentrate towards the centre
 - The water is dark matter, ping pong balls are stars suspended in water
- Corona virus
 - It looks like a strawberry from the outside
- Mosquito
 - It looks like carrot with long legs
 - (Trivia:) many in our group thought that mosquito looks like a ball
- Birds
 - Somdatta is currently tackling the challenge of how to explain specific bird (all birds have the same characteristics, how do you explain specific features when you can't touch them easily?)

Slide 10: going forward

- We want to achieve involvement, inclusion and finally integration between VI community and science
- We want to create a set of examples which can replace/enhance traditional science communication narratives
- We want to develop frugal resources which can be used not just in scicomm but potentially can also reach classrooms
- We want to bridge the gap between targeted scicomm initiatives and everyday scicomm efforts
- What can you do?
 - Challenge: can you explain something about CERN in accessible words? e.g. how does the LHC accelerator work? Our project participants are highly curious about CERN and what goes on here.
 - Can IPPOG come up with more tactile analogies which can be incorporated in CERN/particle physics outreach narratives?
 - Any ideas from you about how we can take this initiative forward are welcome!