

SCIENCE

GALLERY

15.12.19 – 30.01.20

SUB MERGE

ಆದ್ಯತ

Ice painting created at Dorota Borowa's workshop "Ice Painting."

*Please note that the images used throughout the catalogue are the copyright of photographer or Science Gallery Bengaluru and are not available under Creative Commons license unless otherwise specified.

TABLE OF CONTENTS



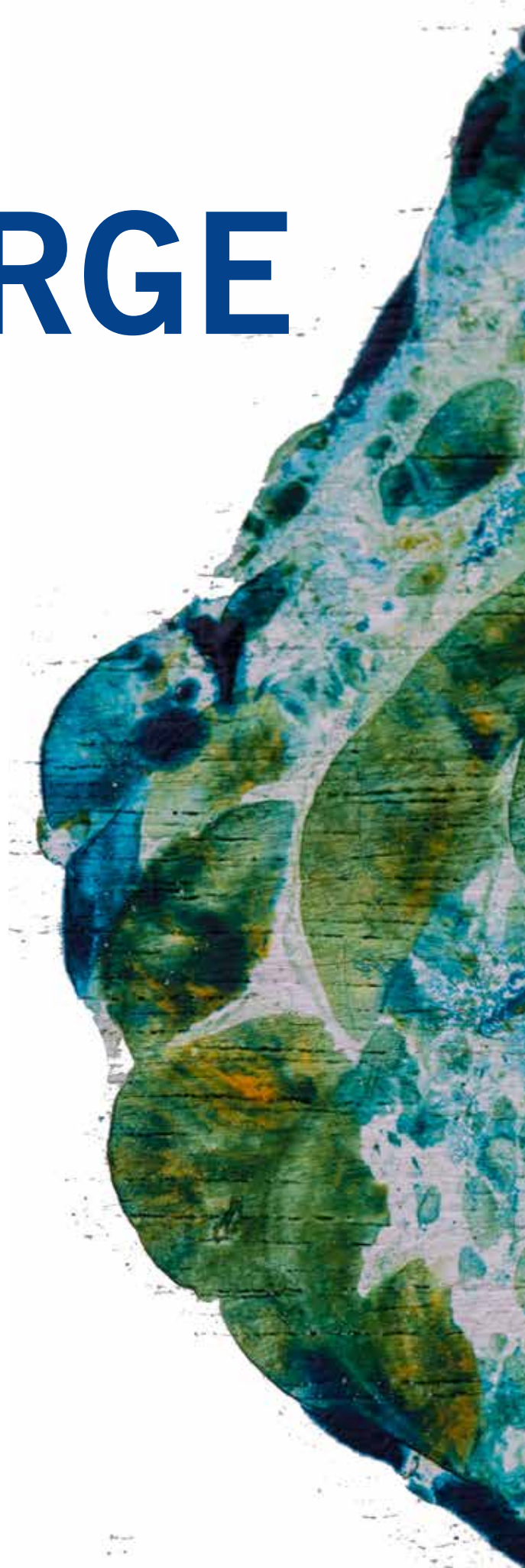
ABOUT SUBMERGE	4
SUBMERGE OVERVIEW	6
THEMES AT SUBMERGE	12
CURATED PROGRAMMES AT SUBMERGE	
- CONFLUENCE	136
- SOAK	168
MEDIATORS	192
TAKE IT FURTHER	196
COLLABORATORS	202
TEAM	204

ABOUT SUBMERGE

On December 15, 2019, we opened our first exhibition season on water, SUBMERGE, to the public. Through this exhibition, we supported the Year of Water initiative as observed by the Government of Karnataka. It also featured *H2O Today*, a popular traveling exhibition by the Smithsonian Institution.

We encouraged visitors to explore the collective experiences of water and reflect on future challenges through a range of dynamic exhibits and workshops. We presented 15 exhibits spread across three floors of Bangalore International Centre, which examined the role of water in our lives, beyond the value that we derive from it.

These exhibits were brought to life through 45 connected programmes such as workshops, lectures, master classes, film screenings and musical performances. Participants engaged with the latest research and thinking on water, and examined its cultural significance, by interacting with scholars and artists from around the world. We also provoked them to begin a dialogue on water as an urgent concern for the city of Bengaluru and global challenge of the Anthropocene.





Ice painting created at Dorota Borowa's workshop "Ice Painting."

SUBMERGE OVERVIEW

EXHIBITS

15 exhibits
16 artists
15 minutes average
time spent at the
exhibition

MEDIATORS

35 Mediators
10 Institutions
10 Languages

45 DAYS
5700+ VISITORS
13 PARTNERS

PROGRAMMES

45 Programmes
44 Facilitators
1,400 Participants

MEDIA ENGAGEMENT

2,37,000 Reach
34,000 Engagements
18 Press mentions



INTERNATIONAL
CENTRE

1512
SUBMERGE





**WATER
IS LIFE**

**Science
Culture
Experiment**

A mediator shows visitors Jennifer Wightman's Munsell Ditcher, 2019.

THEMES AT SUBMERGE

MICRO

Capturing the essence of a lifegiving resource

5 Exhibits / 3 Workshops / 1 Masterclass / 1 Event

While being the most commonplace of all liquids, water is still a weird substance. Unlike most other substances, its density reduces as it is cooled. This strange phenomenon has shaped the Earth and all life on it. A simple molecule made up of just two hydrogen atoms and one oxygen atom— water still holds fundamental mysteries that are yet to be solved. SUBMERGE explored what artists and researchers learn by examining and experimenting with water in molecular detail.

EXHIBITS

ArchaeaBot: A Post Climate Change,
Post Singularity Life-form

FrankenShrimp

The Sounds Tapper

Diagenesis

Argus

PROGRAMMES

Not Your Average Rock Number

X- Filtration

Gravity-Powered Surface Water Treatment

What's in Your Water?

Ice Painting

MESO

Following the flow

3 Exhibits / 5 Workshops / 2 Masterclasses / 1 Event

'Follow the water' has long been an axiom for researchers from various fields, from astrobiology to archaeology; water drives activity wherever it flows. Civilizations, settlements and empires have never sprung forth far from rivers and seas. Its scarcity in parts of the world today is a profound challenge to our existence. How does water shape our lives, legacies and landscapes?



EXHIBITS

Street Puddle Fountain

Munsell Richter

Animas

Grow Cans

Azure

PROGRAMMES

Guerilla Fountain

Songs of the River

Sarjapura Curries

Traces

Water Walk

Capture the World

MACRO

Maintaining a delicate balance

5 Exhibits / 5 Workshops / 1 Event

From polar-ice caps to tidepools, water covers 70% of the Earth's surface. This ubiquitous liquid is not just present outside us, but it is also a constituent of all living things. Water molecules cycle through the atmosphere, rising up to skies to form clouds and coming back down as rain, filling our lakes, rivers and oceans. This eternal cycle is disbalanced, as humanity becomes an agent of change of geological proportions. How can artists and researchers provoke conversations about these changes?

EXHIBITS

The Monsoon Experiment

Rotating Table

Terra Mars Series

H2O Today

PROGRAMMES

Currents

The Hydrosocial Cycle

Transforming Water of Crisis into
Water of Opportunity

Deep Dive

Water on the Red Planet

The Shape of Water

OPENING EVENT

Kiran Mazumdar-Shaw delivers opening remarks at the launch of SUBMERGE.



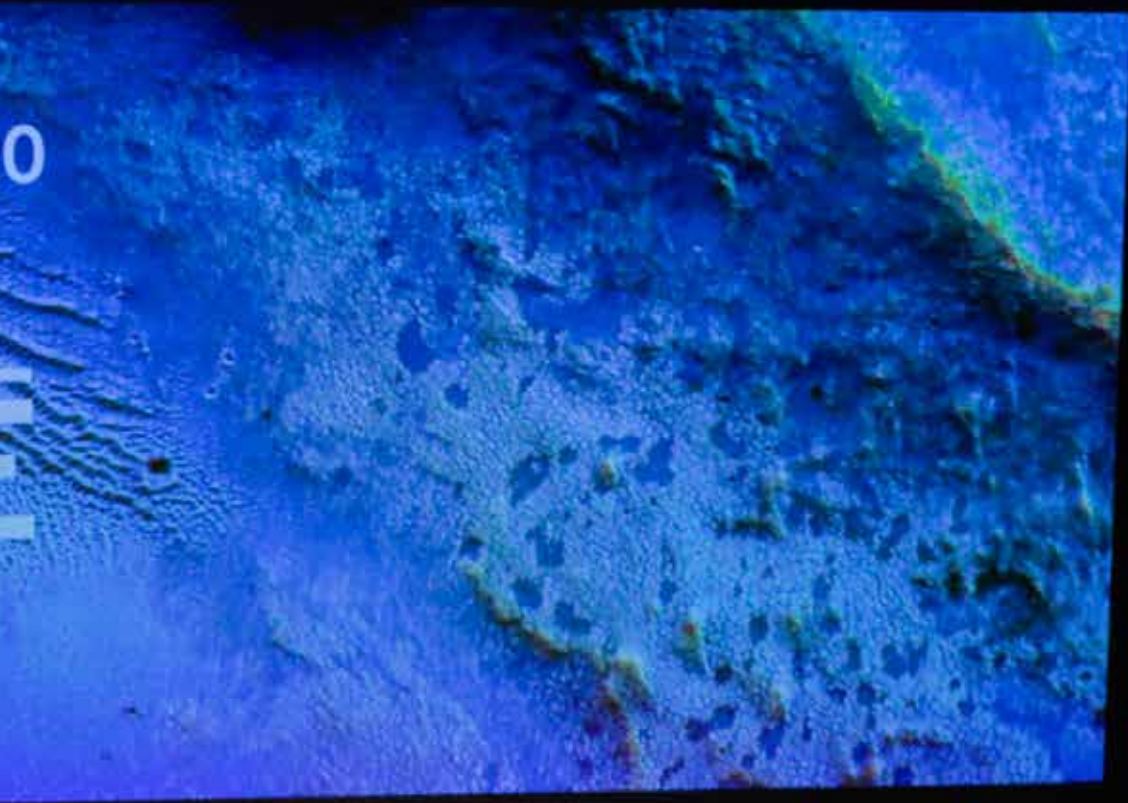
SUBMERGE was launched on 14 December 2019 in a special event with

- **Kiran Mazumdar-Shaw**, Chair and Managing Director, Biocon
- **Andrea Bandelli**, Executive Director, Science Gallery International
- **Ajay Seth**, Managing Director, Bangalore Metro Rail Corporation Ltd
- **V Ravichandar**, Director, Bangalore International Centre



Andrea Bandelli delivers opening remarks at the launch of SUBMERGE.





From L to R: V Ravichandrar, Jahnnavi Phalkey, Andrea Bandelli, Kiran Mazumdar-Shaw and Ajay Seth at the Opening Event.



FrankenShrimp / EXHIBIT

Year: 2019

This live experimentation table examined the role of water in life and death. Dehydrated shrimp eggs were rehydrated and observed under a microscope. Under specific conditions they restarted their life processes. The exhibit pondered the question, what happens to organisms in a dehydrated state? Are they living slowly, are they dying slowly, or is it something entirely different?

ABOUT THE SCHOLAR /

Shashi Thutupalli

Shashi Thutupalli is a Professor of biology at the National Centre for Biological Sciences. His research program aims for a broad understanding of the origins and organization of living systems. Thutupalli's work is interdisciplinary combining experimental and theoretical techniques drawn from physics, engineering and biology.

ICRO



FrankenShrimp was such an interactive exhibit!”

- Sujay Rishi, visitor



Dehydrated shrimp eggs under a microscope in Shashi Thutupalli's exhibit *FrankenShrimp*, 2019.





Visitors at Shashi Thutupalli's exhibit *FrankenShrimp*, 2019.

ArchaeaBot: A POST CLIMATE CHANGE, POST SINGULARITY LIFE-FORM / EXHIBIT

Year: 2019

A post singularity and post climate change life-form, this underwater robotic installation explored what 'life' might mean in a future after climate change. The project was based on new research about archaea (the oldest life forms on Earth) combined with the latest innovations in machine learning and artificial intelligence to create the 'ultimate' species for the end of the world as we know it.

ABOUT THE ARTISTS /

Anna Dumitriu

Anna Dumitriu is a British artist who works with BioArt, sculpture, installation, and digital media to explore our relationship to infectious diseases, synthetic biology and robotics. She has an extensive international exhibition profile including ZKM, Ars Electronica, BOZAR, The Picasso Museum, The V & A Museum Philadelphia Science Center, The Museum of Contemporary Art Taipei LABoral, Art Laboratory Berlin, and The Museum of the History of Science. She was the 2018 President of the Science and the Arts section of the British Science Association. Her work is held in several major public collections, including the Science Museum London and Eden Project.

Alex May

Alex May is a British contemporary digital artist whose practice forges links between art, science, and technology through a wide range of digital new media. His artwork is exhibited internationally at museums and galleries such as Tate Modern (London), Ars Electronica (Austria), LABoral (Spain), Victoria & Albert Museum (London), Royal Academy of Art (London), ZHI Art Museum (China), the Museum of Contemporary Art in Caracas (Venezuela), the Science Gallery in Dublin (Ireland) and Bengaluru (India), Princeton University, Texas A&M University, and the Beall Center for Art + Technology, University of California, Irvine.

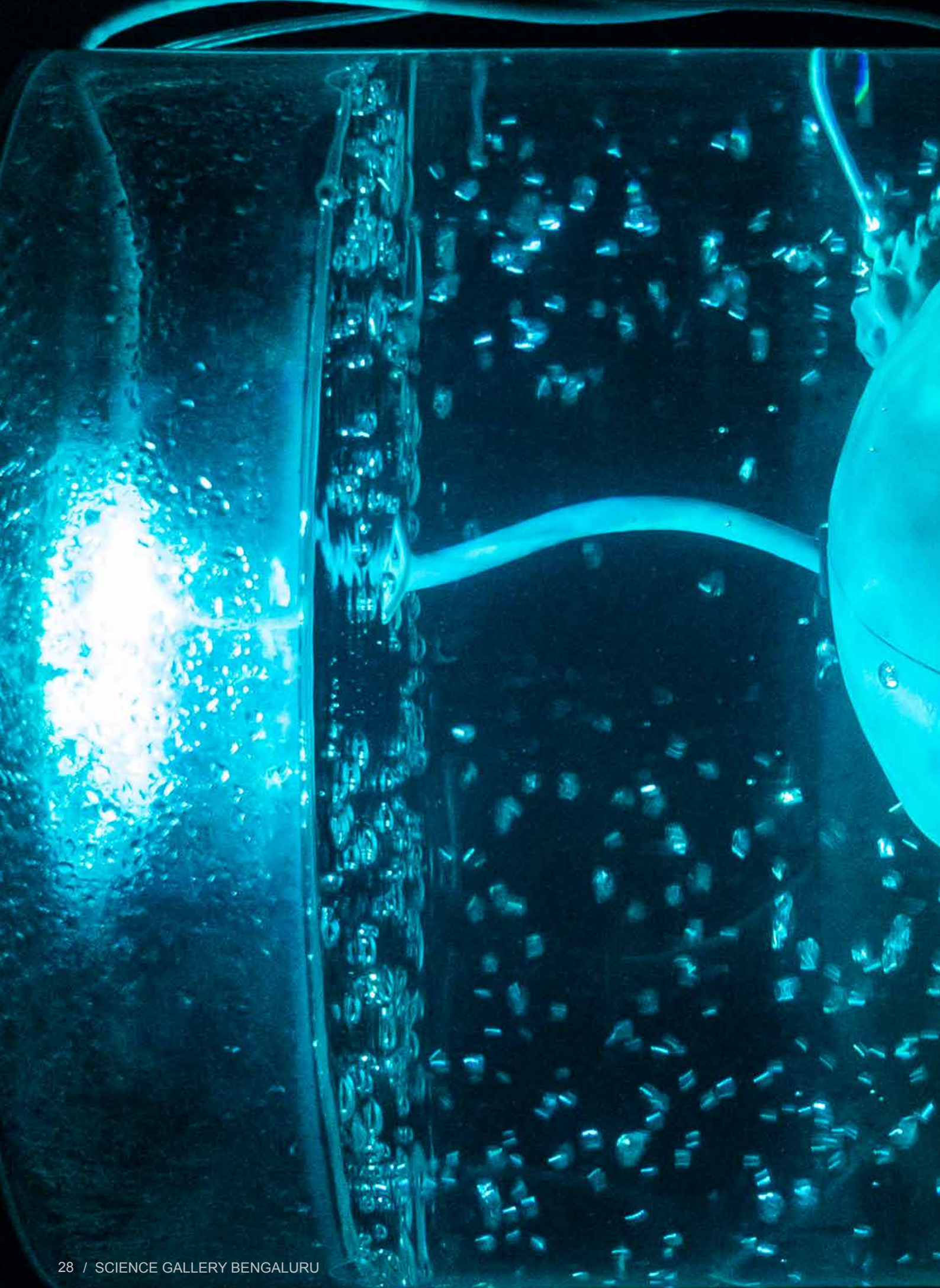


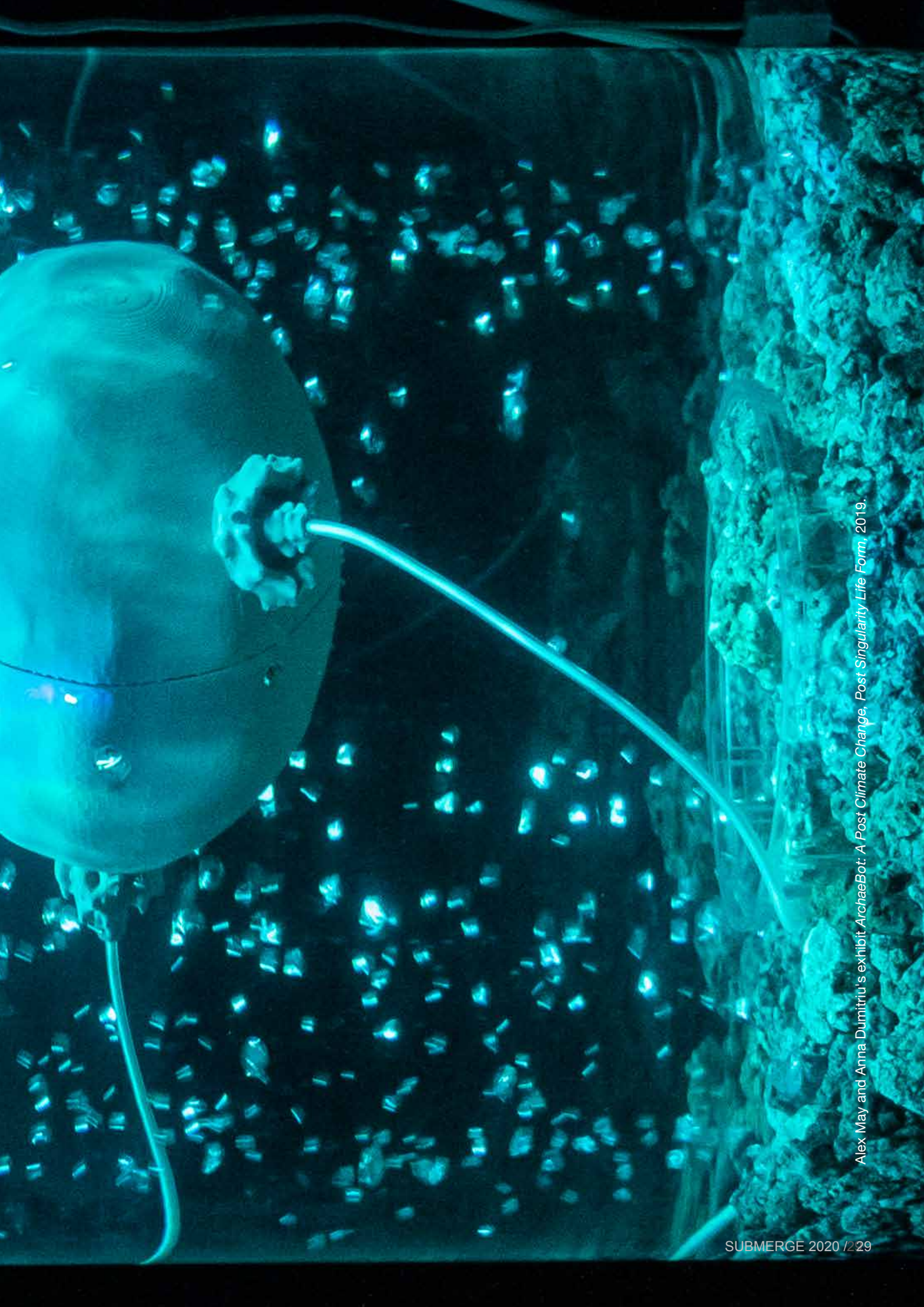
ArchaeaBot was exceptionally well designed.”

- Nausheer Hameed, visitor



Alex May and Anna Dumitriu's exhibit *ArchaeaBot: A Post Climate Change, Post Singularity Life Form*, 2019.





Alex May and Anna Dumitriu's exhibit: Archaebot: A Post Climate Change, Post Singularity Life Form, 2019.

THE SOUNDS TAPPER / EXHIBIT

Year: 2019

This exhibit featured a microscope turned recording device that allowed visitors to hear the micro-sounds of water samples collected from various lakes in Bengaluru. Just like a turntable needle that scans the grooves of a vinyl record, the needles of this modified microscope were in direct contact with the vibrating water membrane. It played the sound of oscillating pulses generated by bacteriological and chemical reactions taking place in the water.

ABOUT THE ARTIST /

Steven Tevels

In his search for the essence of auditory perception, Steven Tevels aims to develop a personal sonographic language; an individual means of 'composing'. A search for newer presentations of 'sound' and the development of other media than the most conventional 'loudspeaker' that we have used for decades. Simply put, sound is an essential and logical component of his working resources.



It was interesting to see how sound can be used to show different aspects of water.”

- Priya M, visitor

WATER SAMPLES WERE COLLECTED FROM THE FOLLOWING LAKES:

Avalahalli lake

Ramagondanahalli lake

Hebbal lake

Kattigenahalli lake

Harohalli lake

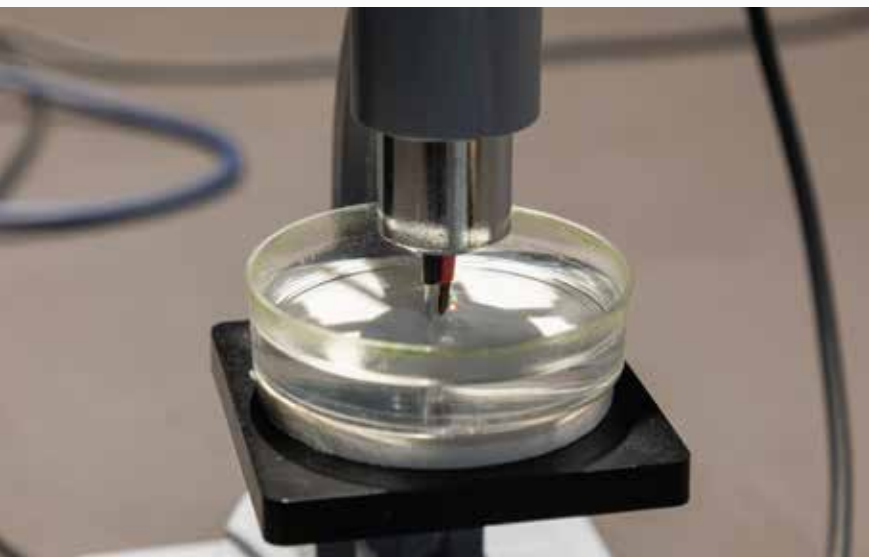
Bagalagunte lake

Rachenahalli lake

Thirumenahalli lake

Kogilu lake

Abbigere lake





Visitors examining water samples collected from different lakes in Bengaluru.

DIAGENESIS / EXHIBIT

Year: 2019

A setup comprising a set of dehydrated stones, a water tank and a submersible microphone that helped us hear the unique sounds, with distinct rhythms, patterns and soundscapes, created by each rock as it absorbed water. This sound anatomy triggered by the movement of water was not just the 'voice' of the stones, but was also a means of exploring the internal structure of the stone, thus decoding a memory older than humans.

ABOUT THE ARTIST /

Ivan Macera

Born in Rome in 1975, Ivan Macera's personal approach is based on experimentation and improvisation which provides the fertile niche that allows for the continuous and necessary evolution of the research of sound. Over the course of the years, he has devoted his studies to observing and analyzing the relationships between resonances as the means of developing audio expression, elaborating and creating sound objects, kinetic sculptures and musical instruments, using largely natural materials from different places.



*Diagenesis was a thought-provoking exhibit...
[!] never knew rocks could make sounds!"*

- Jayanthi, visitor



Dehydrated stones used in Ivan Macera's exhibit *Diagenesis*, 2019.

NOT YOUR AVERAGE ROCK NUMBER / EVENT

Ivan Macera
15 December 2019

This was a musical performance by artist Ivan Macera connected to 'Diagenesis'. He submerged dehydrated rocks in a tank of water equipped with a hydrophone. This process resulted in hissing sounds which he experimented with, creating a unique musical experience for the attendees.



Ivan Maceira immersing dehydrated rocks at his performance, "Not Just A Rock Number."





Mediator shows visitors Ivan Macera's exhibit *Diagenesis*, 2019.

ARGUS / EXHIBIT

Year: 2019

Argus was a bionic plant that continuously monitored water for toxic impurities through nanosensors in its leaves. The nanosensors gave it a glow, which vanished in the presence of heavy metals like lead. This detection took between 15 minutes to 2 hours, much lower in comparison to current quality testing mechanisms, which can take weeks.

ABOUT THE SCHOLAR / ARTIST

Harpreet Sareen

Harpreet Sareen is a scientist, artist and educator based in New York. His work is situated at the intersection of Material Science, Biology and Electronics and draws on the complementary abilities of the biological and artificial worlds. Sareen terms this as 'Convergent Design' to create hybrid substrates and bionic materials that lend themselves for future ecological machinery, sensing systems and interaction design. Sareen is an Assistant Professor of Interaction and Media Design at Parsons School of Design, New York.

“

It was so interesting to see how plants could be turned into sensors.”

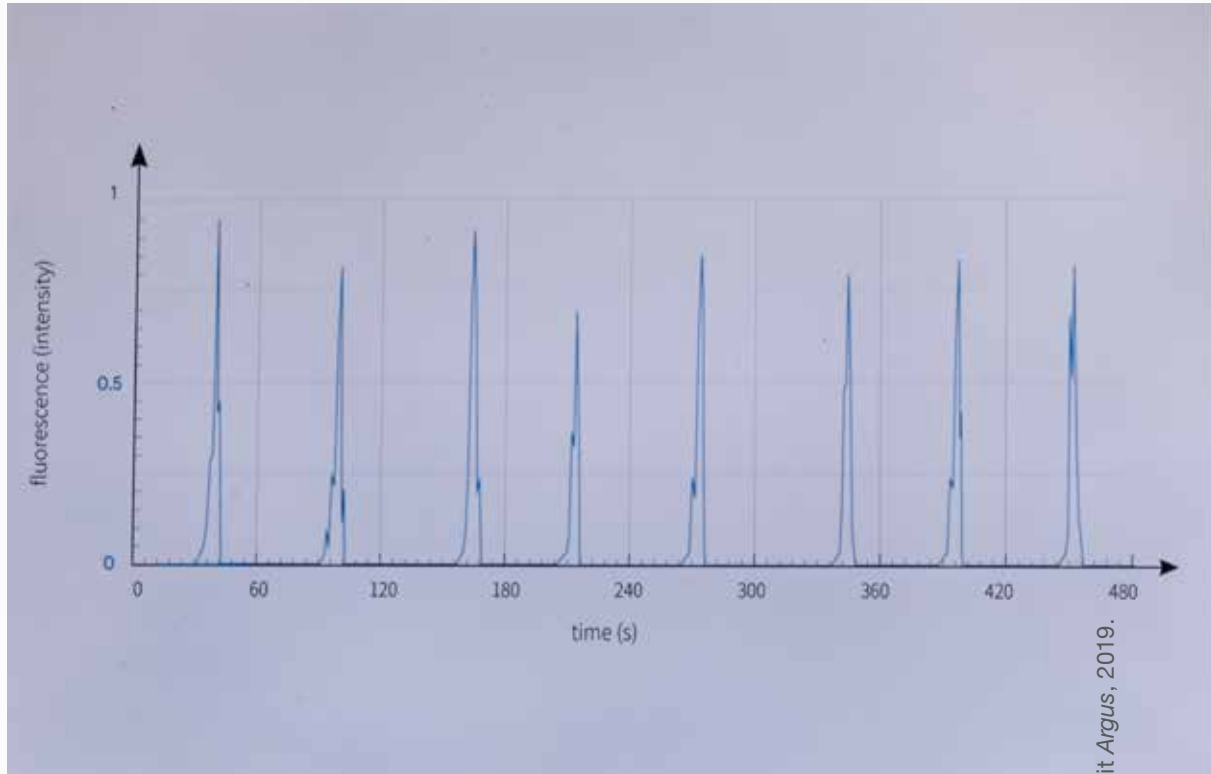
- Mukunda K. Das, visitor



Harpreet Saran's exhibit *Argus*, 2019.



Mediator shows visitors Harpreet Saran's Artus.



Fluorescence readings in Harpreet Saran's exhibit *Argus*, 2019.

X-FILTRATION / WORKSHOP

Krithika Ramchander

04 and 05 December 2019

This workshop was conducted in two locations - first at the venue of the exhibition on 4 January 2020 and the second for community members at Vijaynagar metro station on 5 January 2020. Water researcher Krithika Ramchander shared her work of creating low-cost filters using plant tissues to purify drinking water.

Contamination of drinking water causes more than half a million deaths every year. Participants explored the structure of plant tissues, particularly xylem and discovered how it can be leveraged for purification purposes. Using simple materials, they also constructed their filtration systems.

ABOUT THE FACILITATOR /

Krithika Ramchander

Krithika Ramchander is a Tata Fellow and a first year Master's student in the Mechanical Engineering Department at the Massachusetts Institute of Technology. She did her undergraduate studies in the same field at the Indian Institute of Technology, Delhi. She then worked for a year with Shell Technologies as a Heat Transfer Engineer and was involved in the design and maintenance of furnaces, heat exchangers, and other heat transfer equipment. At MIT, she is currently working on the development of low cost water filters using plant tissue with Rohit Karnik. Having a background in Fluid Mechanics and Heat Transfer, her broad interests include Micro/Nanofluidics and its application in biological systems.



Participants at Kritthika Ramachander's workshop "X-Filtration."

GRAVITY-POWERED SURFACE WATER TREATMENT / MASTERCLASS

William Pennock
11 December 2020

Fulbright scholar and water researcher William Pennock conducted a masterclass on AguaClara—a gravity-powered, electricity-free water purification system. He started the session by talking about the history of water purification. He shed light on how historically the occurrence of cholera and typhoid epidemics reduced after the implementation of filtration and chlorination.

He then presented the challenges of designing water filtration systems including poor feedback mechanism, and conservative designs. He proceeded to speak about how AguaClara plants overcome these constraints, and also cost a fraction of conventional mechanized systems. He proposed that it is easy to maintain and sustainable, therefore a viable option in rural areas, where resources are scarce.

ABOUT THE FACILITATOR /

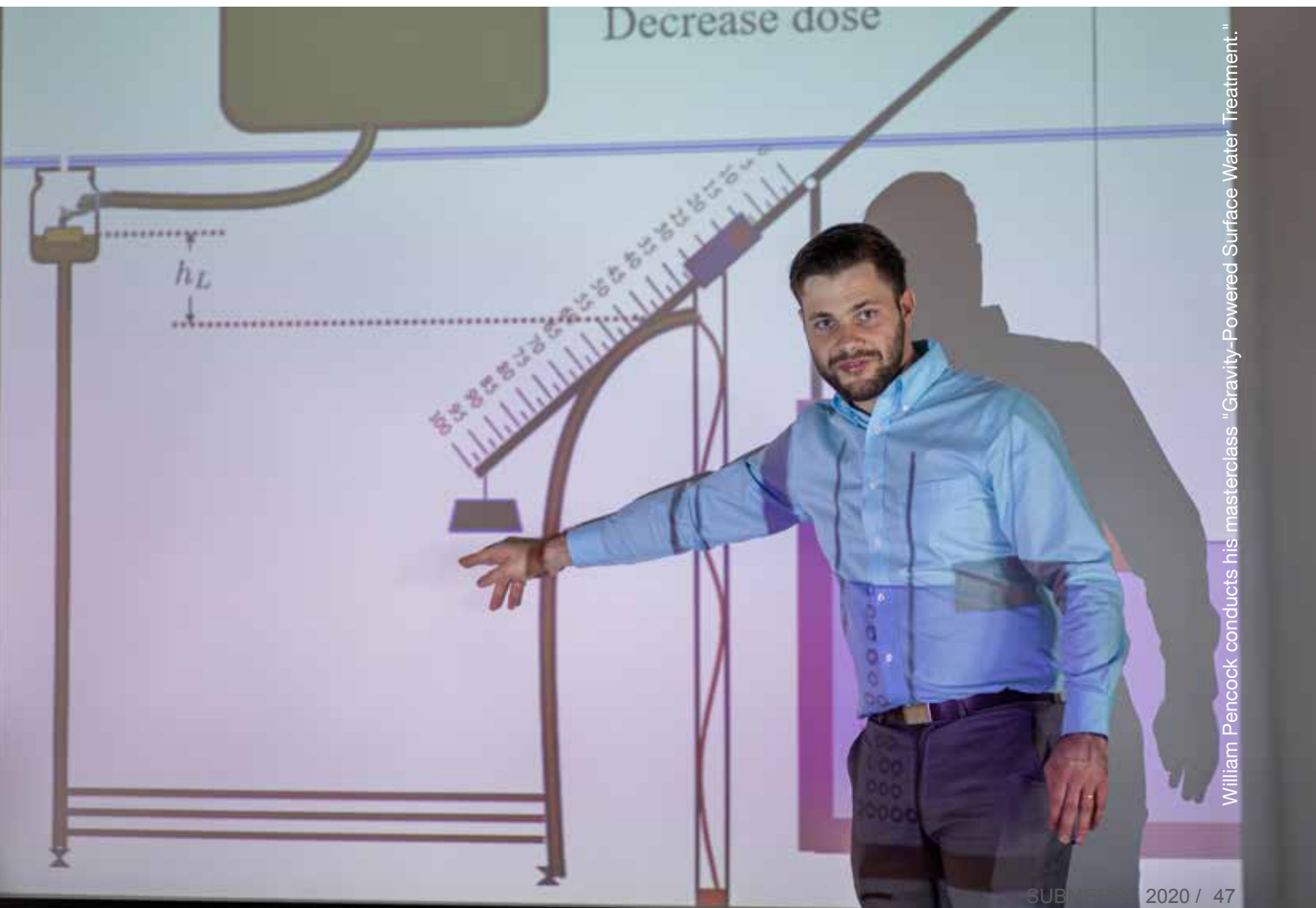
William Pennock

William Pennock is a PhD candidate at Cornell Engineering and a Fulbright scholar. Since 2019, he has been working with Gram Vikas in Bhubaneswar India. Gram Vikas is a not-for-profit, development organisation that helps improve the quality of life in the villages of Odisha and neighbouring States. He was awarded the 2014 National Science Foundation Graduate Research Fellowship. He completed his undergraduate studies in 2013 at the New Jersey Institute of Technology, where he was named the CEE Department's Outstanding Senior.

“

The diverse backgrounds of the audience members allowed there to be diverse opinions during the discussion.”

- Snehaja, programme participant



William Pencock conducts his masterclass "Gravity-Powered Surface Water Treatment."





Participants at William Pencock's "Gravity-Powered Surface Water Treatment."

WHAT'S IN YOUR WATER? / WORKSHOP

21 December 2019

A team at the Foundation for Environmental Monitoring (ffem) conducted a water-testing workshop, where they presented their kit, which allows one to test fluoride and chloride levels in water using a smartphone. Participants brought their water samples to the workshop and got them tested instantly. The team from ffem also spoke to the participants about the impact of high fluoride and chloride levels on our health and how their kits have been particularly beneficial to rural communities.

ABOUT THE FACILITATOR /

ffem is a non-profit based out of Bangalore, that works on issues that have an impact on the lives of millions, but are overlooked by market forces. All the work ffem does is open source (including hardware, is developed in house). Currently, ffem's approach is to develop products designed for easy use to help address these issues.



Mediator shows visitors a water-testing kit as part of firm's workshop "What's In Your Water?"

Viewed from space,

Earth looks
like a **water**
planet.

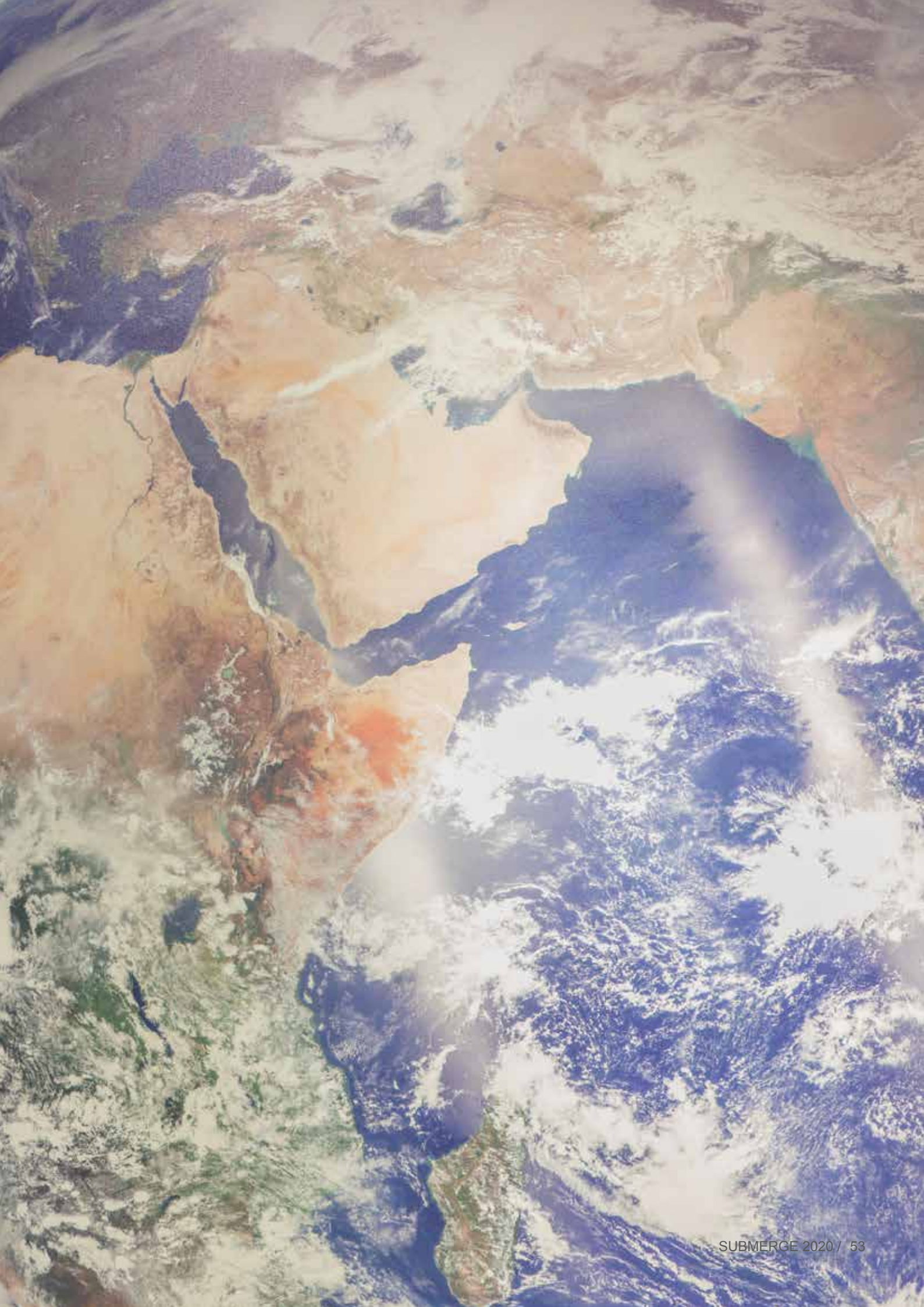
But nearly all of that is

saltwater

and for **humans,**

undrinkable.





ICE PAINTING / WORKSHOP

Dorota Borowa

24 December 2020

During this workshop, artist Dorota Borowa shared her unique technique of creating paintings with ice. Beginning with a short introduction to the technique and her past work, she inspired participants to try it out for themselves. The paintings created by the participants were then displayed in the exhibition gallery.

ABOUT THE ARTIST /

Dorota Borowa

Dorota Borowa is a Polish artist based in Dublin. She received her MFA from the Painting Department at the Academy of Fine Arts in Warsaw, Poland. Borowa exhibits both nationally and internationally and has been awarded a number of Artist in Residence programmes. To date Dorota has received bursaries from the South Dublin County Council (2019) as well as twice from the Polish Ministry of Culture (2006, 2011). She was long-listed for the Aesthetica Art Prize 2016.

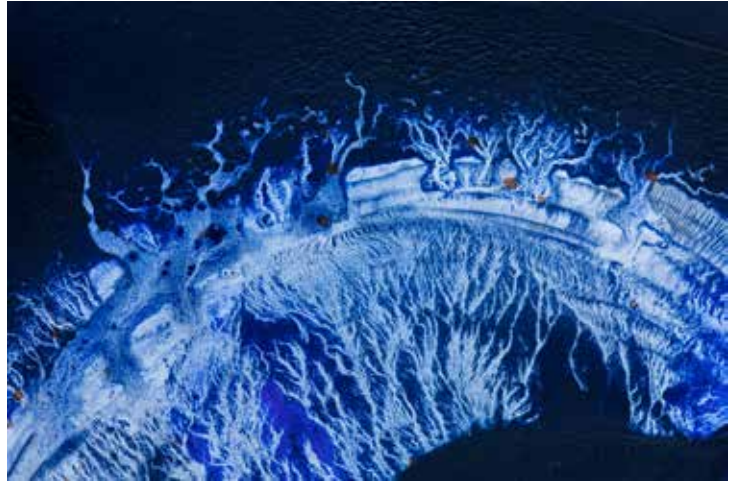
“

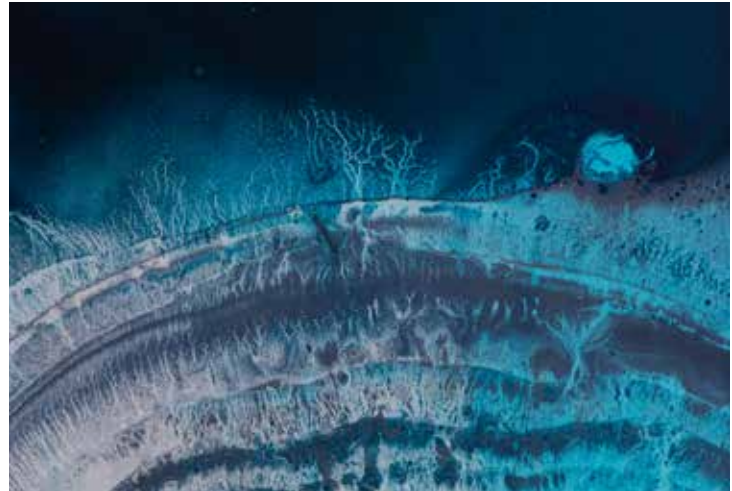
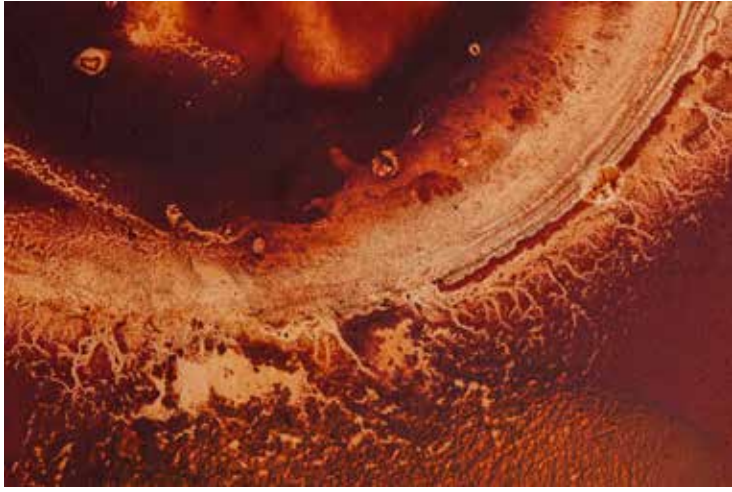
The workshop was not constrained in any way, we were free to experiment and try the ice painting method as many times as we wanted to.”

- Pramodini Warak, programme participant



Dorota Borowa conducts her workshop "Ice Painting."





Works created by participants at the Ice Painting workshop.



STREET PUDDLE FOUNTAIN / EXHIBIT

Year: 2014

A puddle is a conflict between humans and nature, as the rainwater is obstructed in its natural flow by urban surfaces. This project sought an urban hack by creating guerrilla water fountains on street puddles. By converting puddles into an event, the artist drew our attention to their existence and their temporary nature, much like life itself.

ABOUT THE ARTIST /

Oren Ailam is a street artist who works at the interface of technology, performance, poetry. He graduated with a degree in Industrial Design from the Bezalel Academy Jerusalem in 2014. He has participated in the Bat yam festival 2016, DLD theology festival 2018 and has been the Chief Technology Officer and Design Director at FotoMaster. He has had several solo exhibitions including one in 2017 sponsored by Jerusalem municipality, the pissing man performance in 2018 sponsored by bat yam festival, and one in 2018 sponsored by Tel Aviv municipality. Since 2018, he has been running an independent studio for art and technology, and street theology art and has been working towards interactive art education for youth at risk.

MESO



The street is a great place to spread ideas to people as long as you speak their language!”

- Oren Ailam, artist



Oren Ailam's exhibit *Street Puddle Fountain*, 2014.





Oren Allam's exhibit: Street Puddle Fountain, 2014.





Mediators with visitors at Oren Ailam's exhibit *Street Puddle Fountain*, 2019.



GUERRILLA FOUNTAIN / WORKSHOP

Oren Ailam

16 December 2019

In this hands-on workshop participants learnt how to transform everyday street puddles into water fountains with artist Oren Ailam. The workshop began with Oren giving an introduction about his work in Israel, particularly with examples of his street art. After that participants tried to create their own street fountains using simple material. The workshop ended with everyone stepping out of the exhibition venue to test their creations on the street.

A shoe converted into a street puddle fountain at Oren Ailam's workshop "Guerilla Fountain."





Oren Ailam conducts his workshop "Guerrilla Fountain."

MUNSELL RICHTER / EXHIBIT

Year: 2019

These living landscapes, presented like the Gerhard Richter colour chart, were made of samples of mud collected from ten water bodies across Bengaluru. As the microbes in the mud photosynthesized pigments, visitors were exposed to the process of growth and decay of different species of bacteria within this finite ecosystem, resulting in beautiful transforming colourfield paintings.

ABOUT THE ARTIST /

Jenifer Wightman

Jenifer Wightman is a science-based conceptual artist and scientist specializing in greenhouse gas accounting of sustainable bioenergy production systems. Working creatively between art and science, Wightman has taught Biodesign and Sustainable Systems at Parsons and is a research scientist specializing in greenhouse gas mitigation at Cornell. Her bioart work is collected and exhibited internationally, stemming from artistic residencies at Djerassi, Sandbox, Center for Book Arts, Lower Manhattan Cultural Council, among others.



It was so interesting to see how the bacteria were forming, and how the ecosystem was developing on its own. As our mediator explained it -- the artwork was constantly evolving.”

- Visitor

MUD SAMPLES WERE COLLECTED FROM THE FOLLOWING SOURCES:

Aivarakhandapura lake

Mestripalya Lake

Bagalagunte Lake

Curiouscity Construction Site Sarjapur

Varthur Lake

Narsipura Lake

Ramanagara

J P Nagar Puttenahalli lake

Thirumenahalli Lake

Agrahara lake

Chokkanahalli lake





Jennifer Wightman's exhibit *Munsell Richter*, 2019.

ANIMAS / EXHIBIT

Year: 2019

This artwork comprised of suspended panels made of iron-oxidized steel, aluminum, copper, and lead—metals that have exceeded their tolerance in the river Animas in Southwestern Colorado, United States. These metal pollutants were presented in the gallery through sound vibrations, as the panels resonated with real-time data from water quality sensors placed in the river.

ABOUT THE ARTIST /

Brian House

Brian House is an artist who investigates more-than-human temporalities. Incorporating sound, code, and multidisciplinary research, his practice has traversed subjects from artificial intelligence to urban rats. House has exhibited at MoMA, MOCA Los Angeles, Ars Electronica, ZKM, and Cincinnati Contemporary Arts Center, among others. The New York Times Magazine, WIRED, Neural, Creative Applications, and TIME's annual "Best Inventions" issue have featured his work, and his essays and articles have been published in Leonardo, the Journal of Sonic Studies, and e-flux Architecture. Currently, House is Assistant Professor of Art and Studio Head of Digital Media at Lewis and Clark College in Portland, Oregon.

“

Visitors wondered if a similar system to Animas could be used to raise awareness about air pollutants and waste levels in different parts of the country.”

- Aarushi Susheel, mediator



Visitors exploring Brian House's exhibit *Animas*, 2019.





Science
Culture
Experiment

Mediators show visitors Brain House's *Animas*, 2019.

SONGS OF THE RIVER / PERFORMANCE

Rahul Ram
05 December 2019

Musician Rahul Ram from the band Indian Ocean took participants on a musical journey of water across India and explored how rivers are central to our past, present and future. Songs, stories and laughter resounded through the auditorium. Most people know Rahul as a musician but he is also a toxicologist who has been associated with the Narmada Bachao Andolan.

ABOUT THE MUSICIAN /

Rahul Ram

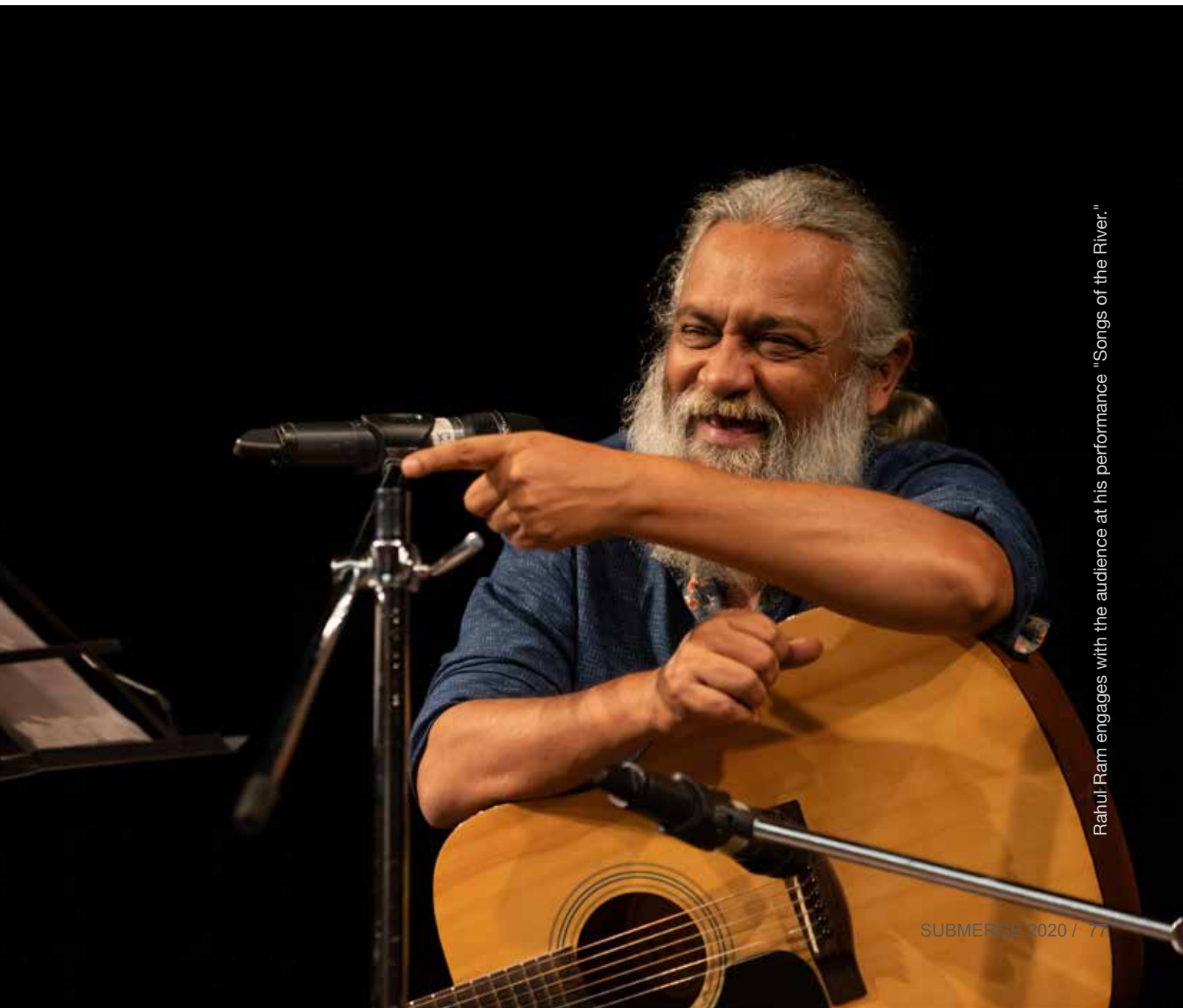
Rahul Ram is an Indian bass guitarist, social activist and music composer. He plays bass guitar in the band Indian Ocean which he joined in 1991. He holds a PhD (1986–90) in Environmental Toxicology from Cornell University. His PhD research on environmental toxicology is what moved him to become an activist with the Narmada Bachao Andolan (1990–95).





Artists are fantastic because they can bridge together various disciplines through various formats such as sound art, visual art, and media art.”

*- Aromar Revi,
Director of Indian Institute of Human Settlements*



Rahul Ram engages with the audience at his performance "Songs of the River."





Rahul Ram at his performance "Songs of the River."



Visitor explores Suresh Kumar's Grow Cans, 2019.

GROW CANS / EXHIBIT

Year: 2019

Grow Cans was an exhibit by Bengaluru Sustainability Grantee artist Suresh Kumar. It introduced visitors to an easy way of growing local greens better suited to Bengaluru's environment in their balconies or terraces using less water. The cans also provided a way to compost kitchen waste helping reduce the burden on the city's waste management systems.



SARJAPURA CURRIES / WORKSHOP

24 January 2020

This lunch and learning session was conducted by artist Suresh Kumar and the team from Sarjapura Curries. Sarjapura Curries aims to revive forgotten plants and edible weeds native to the city of Bengaluru. Suresh introduced participants to their work, explained the importance of cooking with local weeds, and the benefits of sustainable living.

The participants then got to try the delicious meals made by the Sarjapura Curries team and also interacted with the members to further understand their work. This session was conducted in Kannada and English.

ABOUT THE ARTIST /

Suresh Kumar

Visual artist and art teacher, Suresh Kumar moonlights as an ecological pioneer in his native village Volagerekallahalli, near Sarjapura, in the outskirts of Bengaluru. He has launched a unique initiative, Sarjapura Curries, to educate members of his village on growing seasonal and medicinal varieties of vegetables and greens. In 'Sarjapura Curries,' the focus is on growing greens that are not consumed anymore, largely because they are not considered commercially viable.

“

I really enjoyed the opportunity to talk and mingle with people from a different cultural background, and to know more about organic foods directly from the source!”

- Reema Deshpande, participant

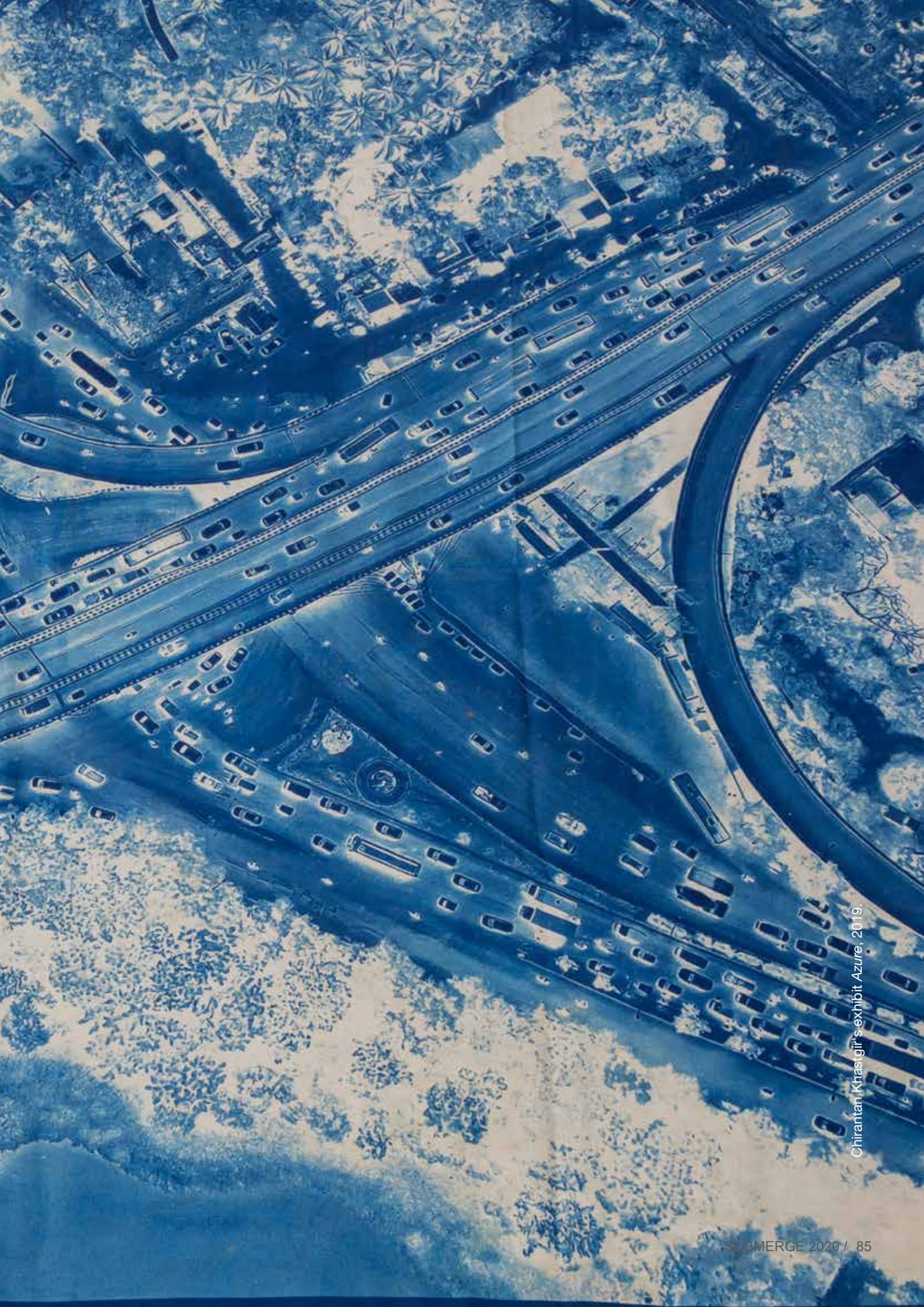


The Satiapura Curries team sets up their programme.

AZURE / EXHIBIT

Year: 2019

Azure consisted of cyanotype prints representing the seven zones of the Bangalore Water Supply and Sewerage Board, where each cyanotype had been washed in water collected from different sources. The mineral composition of the water affected the vividness, contrast, tonal gradation and bleaching of a cyanotype, creating an homage to the transparent liquid.



Chirantan Khaestgir's exhibit Azure, 2019.

TRACES / WORKSHOP

21 December 2019

Photographer Chirantan Khastgir conducted the "Traces" workshop over two days. During this workshop, participants learnt the process of making cyanotypes. The first day covered the history and development of this technique along with a basic introduction to the process. On the second day, participants put theory to practice and created prints of everyday objects and materials.

ABOUT THE PHOTOGRAPHER /

Chirantan Khastgir

Chirantan Khastgir is a photographer and a graduate of the National Institute of Design, India. Evolving out of a desire to influence and mould societal practices towards symbiotic sustenance, Chirantan's practice revolves around visual and literary media. He has worked in the erstwhile conflict regions of Saranda documenting the toll mining is taking on one of India's most dense forest covers. The desire for mass environmental consciousness and re-unification of the built and natural environments drives his work.



The workshop was very interesting and hands-on”.

- Raghav, Programme Participant



Chirantan Khastgir's exhibit Azure, 2019.



Chirantan Khastgir shows *Azure* to participants of his workshop "Traces."





Objects used to create cyanotypes at Chirantan Khastgir's workshop "Traces."



Cyanotype prints exposed to the sun at Chirantan Khastgir's workshop "Traces."

WATER WALK / WORKSHOP

25 December 2020

The Biome Environmental Trust team conducted a special guided walk at Ulsoor lake. Participants got a chance to learn about the lake in a whole new way— by looking at the history of the waterbody. While doing so, they also discovered interesting facts about the wetland system of Bengaluru.

ABOUT THE INSTITUTION /

Biome Environmental Trust creates integrated water management solutions at the home, community and state level. It has been set up with the aim to conduct research, public education, practice-to-policy bridging and policy advocacy in the areas of land-use, planning, energy, water and sanitation.





Photograph of Ulsoor Lake.





Participants at biome environmental trust's event "Water Walk."

CAPTURE THE WORLD / WORKSHOP

25 January 2020

"Capture the World" was a workshop on non-fiction writing conducted by naturalist Pranay Lal. It aimed to help participants get started with their writing and learn how to deliver clear, well-structured narrative prose. Through the session, Pranay recommended important approaches to writing such as counterfactual and critical thinking and spoke about how they are employed in his book 'Indica'. Participants then attempted to write a story on the theme of water using these rules.

ABOUT THE WRITER /

Pranay Lal

Pranay Lal is a biochemist by training and works for a non-profit organisation on public health. He has been a caricaturist for newspapers, an animator for an advertising agency and an environmental campaigner. His first book, *Indica: A Deep Natural History of the Indian Subcontinent* was published by Allen Lane in December 2016. It won the best non-fiction debut award at the Tata Lit Fest in Mumbai in 2017, and the best book award at the Delhi Book Fair 2017. Right now he is working on two books *Malabarica: A Deep Natural History of the Malabar* and *The Cretaceous: The Golden Age of Dinosaurs*.

“

The facilitator used a very different approach to writing, without explicitly mentioning rules and he used various perspectives, which was very helpful.”

- Mohit Das, participant



Pranay Lal engages with participants of his workshop "Capture the World."

PEOPLE AND WATER / EXHIBIT

Year: not determined

'People and Water' consisted of photographs by Jyoti Bhatt and T. S. Satyan, taken between 1968 and 1984. It gave a glimpse into people and their relationship with water. This was from the collection of the Museum of Art & Photography (MAP), Bangalore, The T. S. Satyan Archive and a gift of the T. S. Satyan Family Trust.

ABOUT THE PHOTOGRAPHERS /

Jyotindra Manshankar Bhatt

Jyotindra Manshankar Bhatt, better known as Jyoti Bhatt, is an Indian artist best known for his modernist work in painting and printmaking and also his photographic documentation of rural Indian culture. He studied painting under N. S. Bendre and K.G. Subramanyan at the Faculty of Fine Arts, Maharaja Sayajirao University (M.S.U.), Baroda. Later he studied fresco and mural painting at Banasthali Vidyapith in Rajasthan, and in the early 1960s went on to study at the Academia di Belle Arti in Naples, Italy, as well the Pratt Institute in New York. He was awarded the Padma Shri in 2019.

T. S. Satyan

T. S. Satyan is one of India's earliest photojournalists. In the course of a long and distinguished career spanning over six decades - he photographed political luminaries, royalty, famous personalities and celebrities; chronicled some of India's most significant historical moments and influential figures; as well as produced a large number of landscape and architectural photographs. However, it is his documentation of the anonymous 'ordinary man' that is central to his humanistic vision and that dominates his photographic archive.



Visitor at Jyoti Bhatt and T. S. Satyan's exhibit "People and Water", n.d.



THE MONSOON EXPERIMENT / EXHIBIT

Year: 1979

The Monsoon Experiment was a major international expedition that studied the Asian monsoon system using ground observations, research ships and instrumented aircraft. We displayed a historical object that played a key role in the expedition, which set out in 1979 to explain large scale changes in the atmosphere, and to aid scientists in accurately predicting climatic changes.

ABOUT THE SCIENTISTS /

G. S. Bhat

G. S. Bhat is a geophysicist, who has carried out laboratory experiments, and field experiments over land and ocean. He was the Principal Investigator for the atmospheric component in the three Indian national observational monsoon experiments under the Indian Climate Research Programme (ICRP) viz. the Bay of Bengal Monsoon Experiment (BOBMEX, 1999), the Arabian Sea Monsoon Experiment (ARMEX, 2002-2005), carried out over the west coast of India and Arabian Sea (2002-2003), and the ongoing Continental Tropical Convergence Zone (CTCZ) experiment (2009-2015).

Debasis Sengupta

Debasis Sengupta is an Associate Professor at the Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science. His research interests include oceanography, physics of the Indian Ocean, tropical ocean-atmosphere interaction, predictability of ocean and climate and ocean modelling.

ACRO

“

I had the opportunity to interact with a lot of field specialists, so sometimes I would ask them to explain some concepts to me if they knew it better. This happened especially for The Monsoon Experiment and the Rotating Table...”

- Aarushi Susheel, mediator



G.S. Bhat and Debasis Sengupta's Monsoon Experiment, 1979.





Raman at Digha, 1979
 ... A Prabhu, BS Adiga, first identify a site. ... tent was to make surface ... ssion or cyclone (if possible). ... was necessary to choose a site ... 'was as high as possible.' ... a coast, as the Bay of Bengal,



THE TEAM OF RESEARCHERS FOR THE TOTAL SOLAR ECLIPSE EXPERIMENT AT RAICHUR, 1980.

(L to R) A Prabhu, Roddam Narasimha (fourth), Sethu Raman (fifth), CR Prasad (sixth), BS Adiga (seventh), K Narahani Rao (eighth), Syed Ameenulla (ninth), Srikanth Padubidri (eleventh).
 (Photo courtesy: Roddam Narasimha)

Solar radiation is the dominant driving force of the atmospheric boundary layer. And during a total solar eclipse, as the report of the experiment said, "the radiation from the sun is first switched off, and then switched on again, in a matter of about two-and-a-half hours."



Tower during eclipse

1980 J.S.P.

JODHPUR

The main experiment in 1990 Research Institute in Jodhpur The tower at Jodhpur being e
 (Photo: Radha Raman)



G.S. Bhat and Debasis Sengupta's exhibit Monsoon Experiment, 1979.

CREATING CLOUDS / WORKSHOP

25 January 2020

"Creating Clouds" was conducted offsite at the laboratory of distinguished scientist Roddam Narasimha in Jawaharlal Nehru Centre for Advanced Scientific Research. The session was led by Roddam Narasimha himself and his colleague Vybhav G R. Participants got an opportunity to see how clouds are simulated and studied in a laboratory environment. Participants also got the opportunity to experience the formation of clouds in a chamber.

ABOUT THE SCIENTIST /

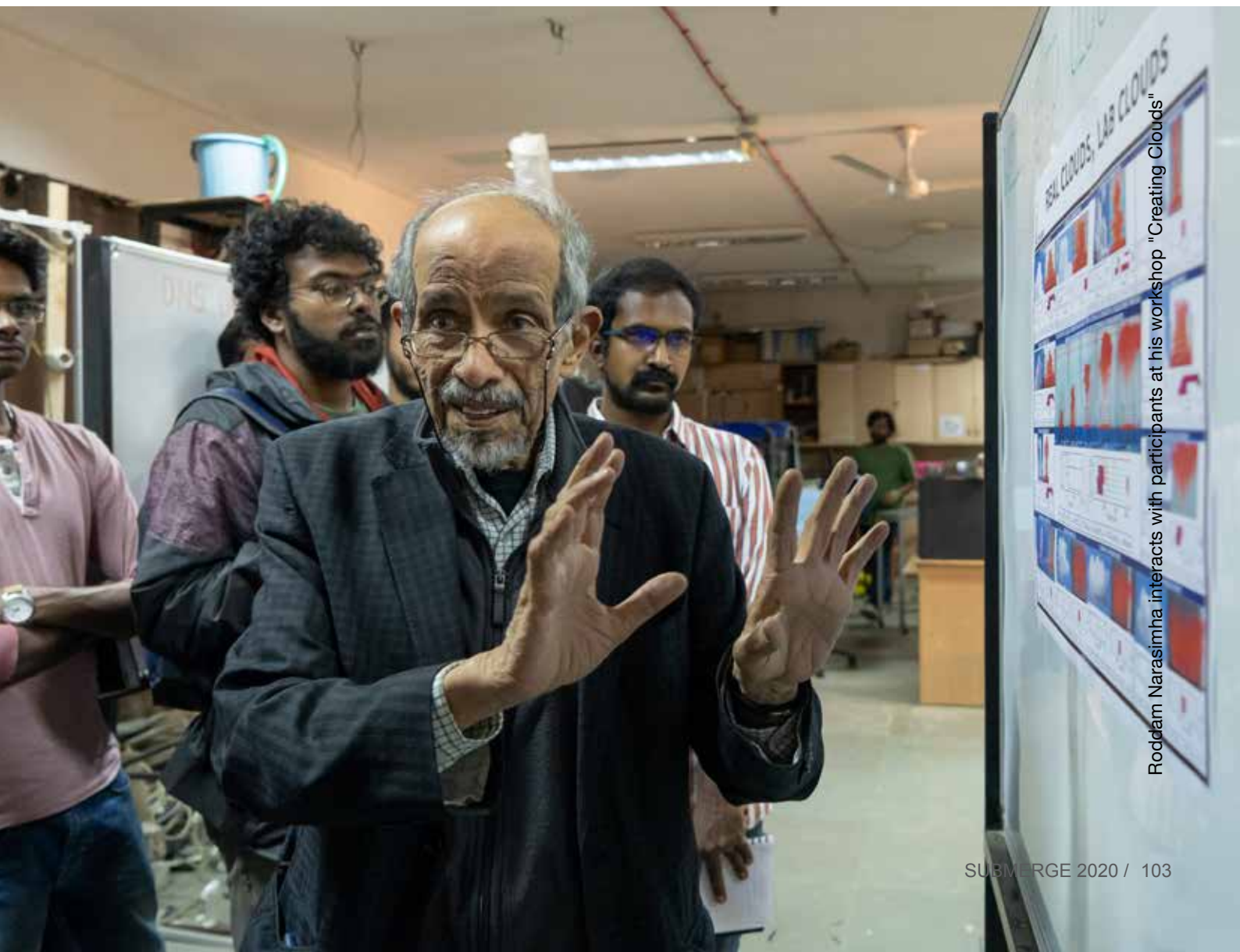
Roddam Narasimha

Roddam Narasimha (1933–2020) was the Chairman of the Engineering Mechanics Unit at the Jawaharlal Nehru Centre for Advanced Scientific Research, and the Director of the National Institute of Advanced Studies, Bangalore. He was awarded the Padma Vibhushan, India's second-highest civilian award, in 2013. He was an aerospace scientist and fluid dynamicist who also held the Pratt & Whitney Chair in Science and Engineering at the University of Hyderabad.

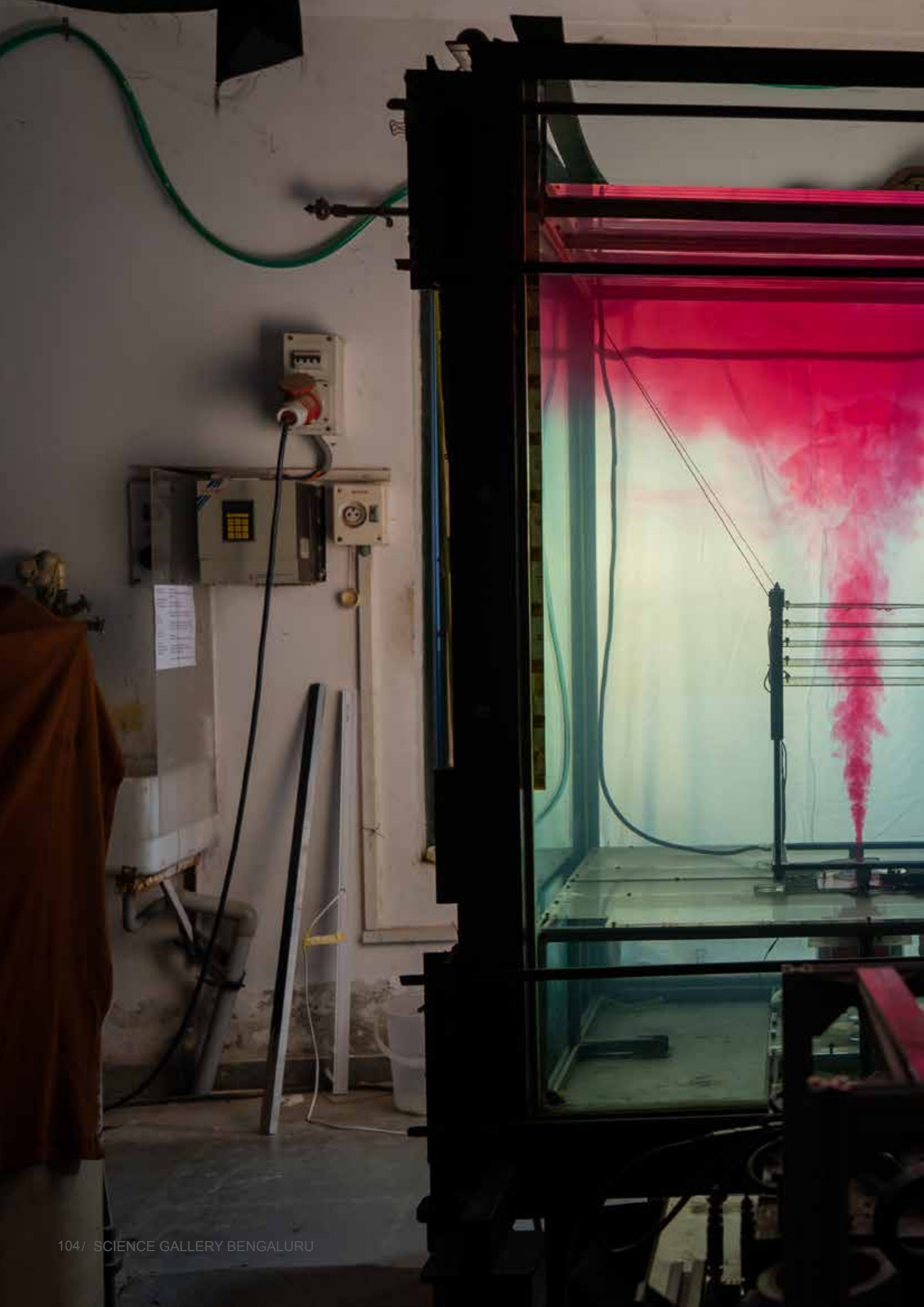
“

I think experiments are an integral part of science, just as theory is— both are necessary. In many cases you don't know what will happen once you begin experimenting. There is something that you will see, which nobody has seen before.”

- Roddam Narasimha, Scientist



Roddam Narasimha interacts with participants at his workshop "Creating Clouds"





Cloud flows created in Roddam Narasimha's laboratory during his workshop "Creating Clouds."





Participants investigating the formation of cloud flows at Roddam Narasimha's workshop "Creating Clouds."

THE ROTATING TABLE / EXHIBIT

Year: Unknown

This historical object demonstrated how earth's rotation influences atmospheric circulation and ocean currents. Consisting of a rotating table and a convection tank designed for the simulation of extra-tropical and tropical circulations, it also allowed for the study of jets, plumes and thermals.

ABOUT THE SCIENTISTS /

G. S. Bhat

G. S. Bhat is a geophysicist, who has carried out laboratory experiments, and field experiments over land and ocean. He was the Principal Investigator for the atmospheric component in the three Indian national observational monsoon experiments under the Indian Climate Research Programme (ICRP) viz. the Bay of Bengal Monsoon Experiment (BOBMEX, 1999), the Arabian Sea Monsoon Experiment (ARMEX, 2002-2005), carried out over the west coast of India and Arabian Sea (2002-2003), and the ongoing Continental Tropical Convergence Zone (CTCZ) experiment (2009-2015).

Debasis Sengupta

Debasis Sengupta is an Associate Professor at the Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science. His research interests include oceanography, physics of the Indian Ocean, tropical ocean-atmosphere interaction, predictability of ocean and climate and ocean modelling.

“

The way that the mediators have learnt what the table does, and performed their own experiments on it is fascinating.”

- Debasis Sengupta, oceanographer



Tide flows at G. S. Bhat and Debasis Sengupta's exhibit *The Rotating Table*, n.d.





Mediators show visitors G. S. Bhat and Debasis Sengupta's exhibit *The Rotating Table*, n.d.

CURRENTS / WORKSHOP

22 January 2020

The "Currents" workshop was focused on exploring why currents are formed in the ocean, how they impact our world and in what ways they are studied in laboratories. Oceanographer Amit Tandon introduced key concepts to the participants as well as demonstrated them through simple experiments on the Rotating Table, a historical object displayed at the exhibition.

ABOUT THE SCIENTIST /

Amit Tandon

Amit Tandon is Professor of Mechanical Engineering at the College of Engineering, an affiliate professor in the School of Marine Science and Technology at the University of Massachusetts Dartmouth, and an Adjunct Scientist at the Woods Hole Oceanographic Institution. After completing his PhD in 1992 in mechanical engineering, Tandon received two successive competitive postdoctoral fellowship awards, first in ocean modeling and then in climate system modeling from the University Corporation for Atmospheric Research (1992–94, 1994–96). He joined the University of California Santa Cruz (1996–98) as assistant research professor, and subsequently joined the College of Engineering at UMass Dartmouth, where he has been since 1999.

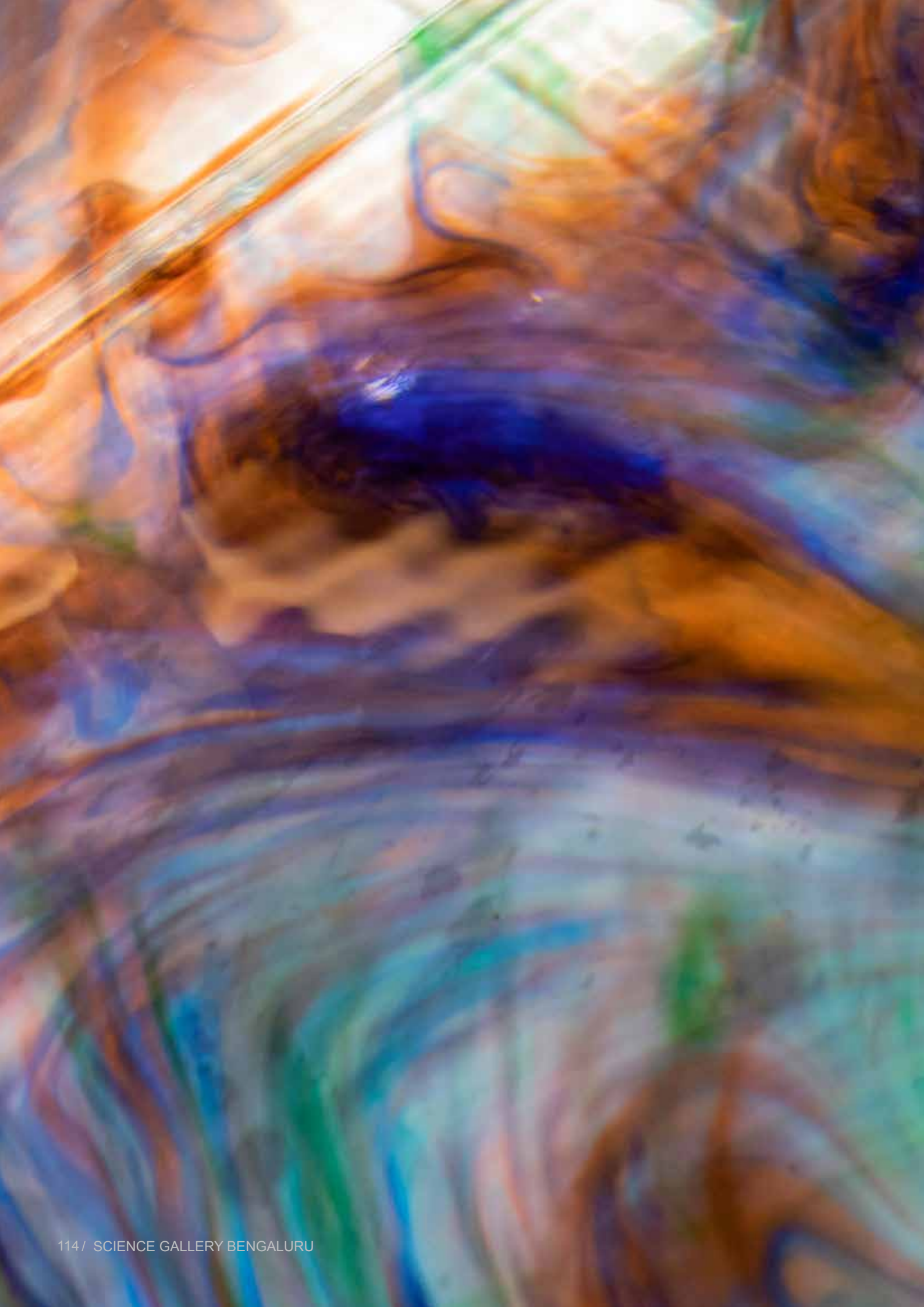
“

My key takeaway from the workshop was that you should always look at science not just in a theoretical fashion but also in an experimental way. Only then would you be able to progress and take science in the right direction."

- Programme Participant



Amit Tandon demonstrates how ocean currents are formed at his workshop "Currents."





Colourful currents formed at Debasis Sengupta's exhibit *The Rotating Table*, n.d.

THE HYDROSOCIAL CYCLE / MASTERCLASS

26 January 2020

The goal of the masterclass was to disrupt the understanding of the hydrological cycle, which is viewed as a natural phenomenon where people are not involved in. The facilitator, Trevor Birkenholtz argued that with Anthropocene, there is no water on Earth which doesn't have a human imprint and is directly or indirectly the product of human action. Towards the end of the session, participants broke into groups and discussed their own water problems and possible solutions, which they later presented to the class.

ABOUT THE SCHOLAR /

Trevor Birkenholtz

Trevor Birkenholtz is a political ecologist and development geographer with regional interests in South Asia and the United States, empirical interests in water development, and methodological expertise in mixed methods field research. Since 2001, he has been advancing these concerns by investigating the transformation of groundwater-based irrigation and water use, and the construction of rural and urban water-supply infrastructure in the arid and semi-arid zones of India. Birkenholtz is currently writing a book, tentatively titled, *Infrastructures of Dispossession*, where he examines India's National River-Linking Project.



The masterclass was topical, relevant and timely. His research was eye-opening.”

- Ishan Gupta, Programme Participant



Trevor Birkenholtz conducts his masterclass "The Hydrosocial Cycle."

TRANSFORMING WATER OF CRISIS INTO WATER OF OPPORTUNITY / MASTERCLASS

30 January 2020

In this masterclass, Arup K. Sengupta gave an overview of the challenges of water across the world along with the latest technological developments which are helping solve this problem. He explored the pollution of surface water, consisting of aquatic systems that are above ground, such as streams, lakes and rivers. In the second part of the masterclass, participants visited the Mr Water filtration centre, a local filtration centre in Indiranagar, Bengaluru that provides filtered groundwater to the community.

ABOUT THE SCHOLAR /

Arup K. Sengupta

Arup K. Sengupta is a Professor at the Lehigh University. He is leader in environmental technology research and education, and has guided dozens of graduate students to successful careers in engineering practice and research. His award-winning research has expanded the field of ion exchange science and technology in solving environmental problems, and has led to the development of new classes of hybrid ion exchangers that have been incorporated into water and wastewater treatment processes globally. He heads an international, interdisciplinary effort to develop and promote a sustainable treatment system that provides drinking water free of arsenic to thousands of people all over the world.

“

I really enjoyed our visit to the water treatment plant.”

- G. Yogeshwaran, Programme Participant



Arup K. Sengupta conducts his masterclass "Transforming Water of Crisis into Water of Opportunity."

H2O TODAY / EXHIBIT

25 December 2020

We hosted Smithsonian's popular travelling exhibit - H2O Today. It consisted of panels that invited visitors to explore the beauty and essential nature of water. The panels also examined the diversity and challenges of our global water sources and promoted conversation, creativity, and innovation across disciplines.

H2O Today was supported by the Smithsonian Institution's Traveling Exhibition Service and facilitated by the American Consulate, Chennai.

ABOUT THE INSTITUTION /

The Smithsonian Institution is the world's largest museum, education, and research complex, with 19 museums and the National Zoo—shaping the future by preserving heritage, discovering new knowledge, and sharing resources with the world.



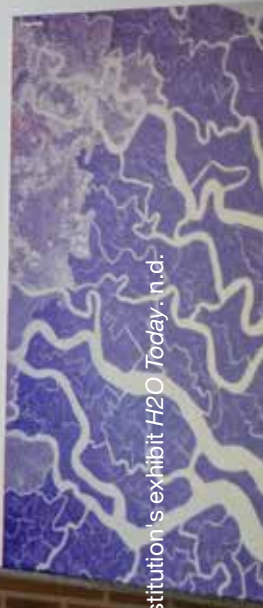
WATER MOVES AND SHAPES



Photo by [unreadable]

Architect and Sculptor

Water is an artist, painter, architect, shaping landscapes as it meanders around the world. Through mountain ranges, and in the seas, it comes sculpt the land, and moving water carves and creates unique patterns. It creates soft or colorful and can reshape its paths. Small flows and small streams take way from the big rivers, and then it all flows back, leaving the land.



Visitors explore the Smithsonian Institution's exhibit H2O Today. n.d.



We forget that the water cycle and the life cycle are one.

We take water and put it to work.

RIPPLE EFFECTS

WATERSHEDS

From the Mountains

FARMS

Agribusiness



Visitors explore the Smithsonian Institution's H2O Today. n.d.

TERRA MARS SERIES / EXHIBIT

Year: 2019

Imagine if Earth and Mars were interchanged? These videos presented artistic satellite images of Earth and Mars developed using Artificial Intelligence. The views of Mars were based on neural network models generated from Earth's topographical data, and vice versa. These images could be interpreted in multiple ways, such as a playful remix of planets, a preview of terraformed Mars, or a dystopic future of Earth.

ABOUT THE ARTIST /

Shi Weili

Shi Weili is an artist and technologist. He creates unconventional experiences to provoke people's consciousness. While most of his works involve substantial use of technology, he always tries to infuse them with a dose of Zen mindfulness. Artworks of Weili have been exhibited in prestigious venues including National Museum of China, New York Hall of Science, and Ars Electronica.

“

As both Terra Mars and ArchaeaBot lead us to thinking about a hypothetical post-singularity world, a visitor once asked me the reason why certain people are optimistic about life and a few other pessimistic. It really got me thinking that one's thought process is always a result of the kind of people and thinking one is surrounded by!”

- Mitreya Vellala, mediator



A mediator show visitors Shi Weili's exhibit Terra Mars Series, 2019.





Shi Weili's exhibit *Terra Mars Series*, 2019.

WATER ON THE RED PLANET / WORKSHOP

27 December 2019

The aim of this workshop was to inspire young adults to imagine a scenario where water existed on Mars, and speculate on what it would behave like. Hydrologist Rama Govindarajan facilitated the first part of the workshop, where participants learnt about the basic equations which govern water and its movement and how the physical forces in Mars would affect this behaviour. Speculative fiction writer Anil Menon introduced the principles of good speculative fiction writing through imaginative writing exercises.

ABOUT THE HYDROLOGIST /

Rama Govindarajan

Rama Govindarajan is a fluid-dynamicist at the International Centre for Theoretical Sciences. She was formerly working at the Engineering Mechanics Unit of the Jawaharlal Nehru Centre for Advanced Scientific Research from 1998-2012 and as a professor at the Centre for Interdisciplinary Sciences in Tata Institute for Fundamental Research Hyderabad from 2012-2016. Govindarajan is a recipient of the Shanti Swarup Bhatnagar Award for the year 2007.

ABOUT THE WRITER /

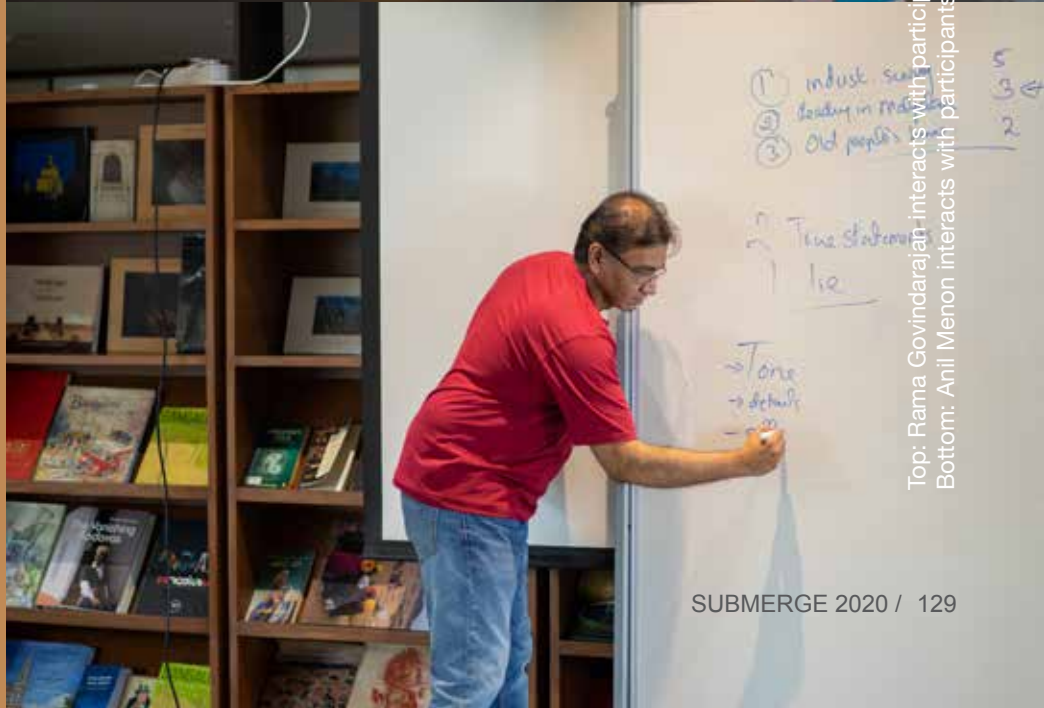
Anil Menon

Anil Menon is a writer of speculative fiction, as well as a computer scientist with a Ph.D. from Syracuse University, who has authored research papers and edited books on Evolutionary Algorithms. After working for several years as a computer scientist, he has directed his creative energies towards fiction. His short stories and reviews have appeared in the anthology series Exotic Gothic, Strange Horizons, Interzone, Lady Churchill's Rosebud Wristlet, Chiaroscuro, Sybil's Garage, Apex Digest and other magazines.



"There's often a misconception that people from humanities or soft sciences cannot write science fiction. Today, we saw how people from any background can write well given the opportunity to do so."

- Anil Menon, writer



Top: Rama Govindarajan interacts with participants at her workshop "Water on the Red Planet."
Bottom: Anil Menon interacts with participants at his workshop "Water on the Red Planet."

DEEP DIVE / WORKSHOP

10 January 2020

In this workshop, open data researcher Craig D'Souza introduced participants to the use of open-satellite data to better understand and analyse natural resources. Participants learned how to use different datasets such as Vectors and Rasters. They also parsed various satellite images to understand how geographical data is stored in the Google Earth Engine.

ABOUT THE RESEARCHER /

Craig D'Souza

Craig D'Souza graduated with a Master's in Environmental Policy from the University of Delaware. His area of research has centred around the use of environmental and socio-economic data to understand the dynamic nature of water issues. At the University of Delaware he worked on research reports covering topics such as the potential of urban Green Infrastructure in addressing Non Point Source pollution, and also Environmental Justice issues surrounding urban industrial contamination. D'Souza has contributed to the thematic projects of the 'Forum for Policy Dialogue on Water Conflicts in India' including Industrial-Agricultural water allocations and the Right to Water and Sanitation in India.

“

This workshop gave me insight into how I could look for water data, how I could interpret water data and use it to tell stories.”

- Programme Participant



Craig D' Souza interacts with participants at his workshop "Deep Dive."

THE SHAPE OF WATER / WORKSHOP

12 December 2020

In this workshop, participants learnt how to use modern technologies to map out water bodies with conservation scientist Shashank Srinivasan. It focused on the use of drones and imagery obtained from them to differentiate between water and non-water bodies. Through examples and exercises, participants got a chance to create data-sets, analyze them and understand how they could use this information for advocacy and communication.

ABOUT THE SCIENTIST /

Shashank Srinivasan

Shashank Srinivasan is a conservation scientist based in India. He recently founded a company, Technology for Wildlife, that helps organisations amplify their conservation impact through the appropriate use of modern technology. His most recent previous role was with WWF-India in Delhi as their Coordinator for Spatial Analysis. He holds an MRes from the University of York in Ecology and Environmental Management and an MPhil in Conservation Leadership from the University of Cambridge, and has worked extensively in the Indian Himalaya.

“

The facilitator provided us with a lot of information on how to work and infer drone data and on the scope of using technology for conservation and advocacy.”

- Akhilesh Singhal, Programme Participant



Shashank Srinivasan interacts with participants at his workshop "The Shape of Water"





Shashank Srinivasan interacts with participants at his workshop "The Shape of Water."

CONFLUENCE

15 lectures

In our public lecture series, *Confluence*, we brought together experts from various disciplines to explore the latest thinking and research on water. Participants attended lectures by geologists, environmental historians, water activists and ecologists, among others. Each of the lectures were followed by tutorials where young adults interacted with the experts in a smaller group setting. This series was organised in collaboration with the Indian Academy of Sciences.



From L to R: Mihir Shah conducts his tutorial.
Harini Nagendra conducts her tutorial.
Ravi Agarwal conducts his tutorial.
Veena Srinivasan conducts her tutorial.

ABOUT THE CURATOR /

Srikanth Sastry is a Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru. His research interest lies in the area of statistical mechanics, with a focus on understanding a range of unusual and interesting properties of liquids and other soft condensed matter, addressed with computation as a major tool. He has served as a Faculty Fellow at the JNCASR between 1998-2003 and as an Associate Professor from 2003-2008. He worked as a Professor at the TIFR Centre for Interdisciplinary Sciences in Hyderabad from 2012-2014.



Having a public lecture series is firstly about bringing science out of institutions and laboratories into the public domain, but it's a kind of displacement that will hopefully have broader implications."

- Srikanth Sastry, curator

WHY DOES THE RIVER NEED TO FLOW FROM THE MOUNTAINS TO THE SEA?

Jagdish Krishnaswamy

15 December 2019

In this talk, hydro-ecologist Jagdish Krishnaswamy contested the idea that rivers flowing into the sea are a waste. Through examples, he illustrated how the flow of rivers helps maintain a rich biodiversity along its course which is essential for ecological balance. He further built a case for reducing our water consumption in key sectors such as agriculture and putting back more water into our rivers. He highlighted the need for the conservation of remaining free-flowing rivers or less regulated to preserve their functions and services.

ABOUT THE HYDRO-ECOLOGIST /

Jagdish Krishnaswamy holds a Ph.D in Environmental studies, Duke University, North Carolina, USA. His research and teaching interests include ecohydrology, landscape ecology, conservation planning, ecosystem services and applications of bayesian approaches in understanding complex changes in the environment over space and time. He has coordinated the establishment of instrumented catchments in the Western Ghats and in the Himalayas to study the impacts of land-cover and climate variability on hydrological processes.



We need to revisit the notion that river water flowing into the sea is a wasteful thing."

- Jagadish Krishnaswamy, hydro-ecologist



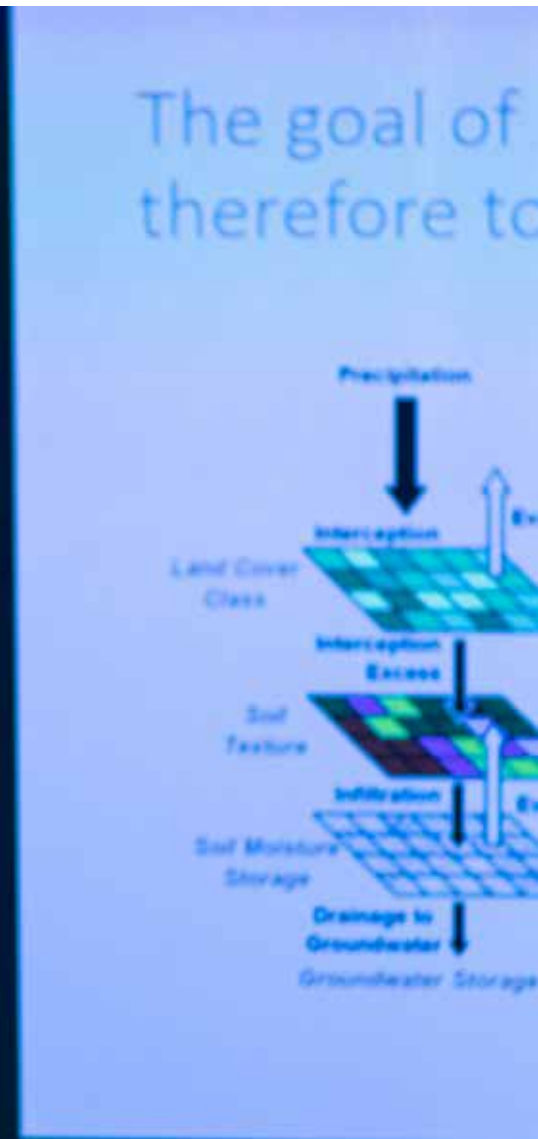
Jagadish Krishnaswamy delivers his lecture "Why Does the River Need to Flow from the Mountains to the Sea?"



The young people in the audience asked very interesting and sharp questions on what science is, how we can do the right kind of science, and how we can build the right kind of skills. I'd like to congratulate the Science Gallery team on bringing science back into our everyday lives and our everyday conversations."

- Veena Srinivasan, water researcher

Veena Srinivasan delivers her lecture "New Frontiers in Water Science."



NEW FRONTIERS IN WATER SCIENCE

Veena Srinivasan

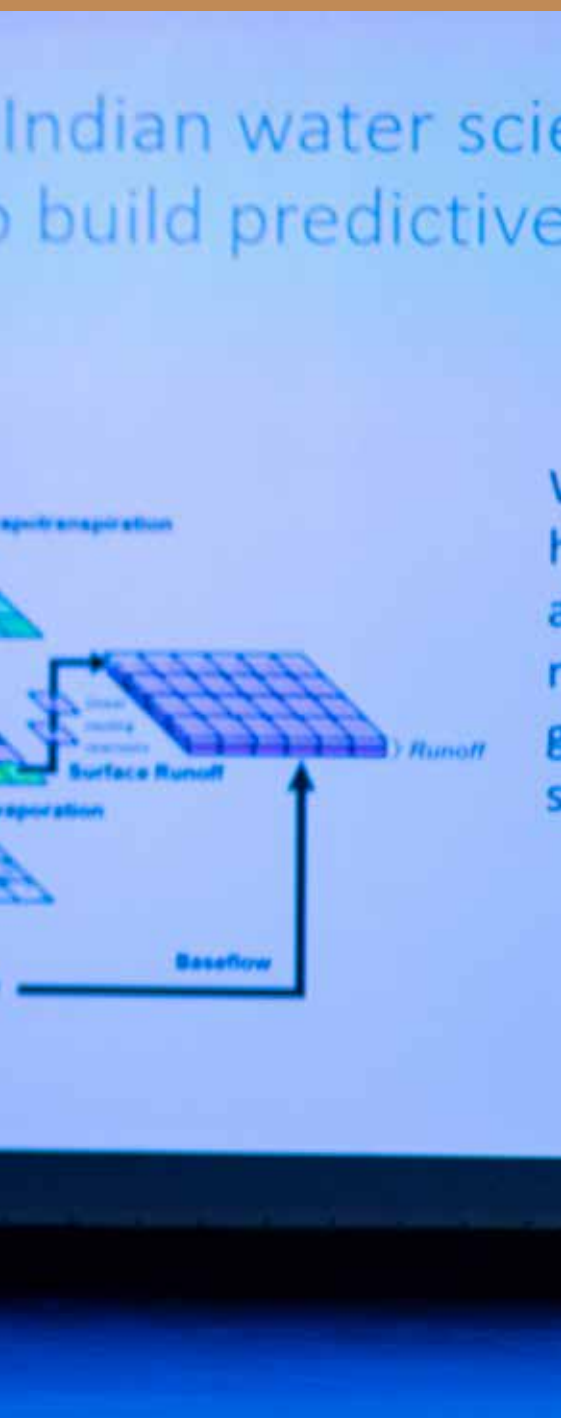
17 December 2019

In her lecture, water researcher Veena Srinivasan called for a new approach to science that is problem driven, interdisciplinary and grounded in real-world questions. She presented three examples to illustrate why we must consider anthropologic changes in this new approach. She addressed the case of disappearing surface water in the Upper Arkavathy watershed near Bengaluru, the impact of droughts on Chennai and questioned whether tree planting is good or bad for streams.

ABOUT THE WATER RESEARCHER /

Veena Srinivasan is a Fellow at the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, where she leads the Water, Land and Society Programme. She also leads the Centre for Social and Environmental Innovation. Veena's research interests include inter-sectoral water allocation, impacts of multiple stressors on water resources, ground and surface water linkages, and sustainable water management policy and practice.

Veena has won several awards for her work including the 2015 Jim Dooge Award for best paper in the journal Hydrology and Earth System Science from the European Geophysical Union, the 2012 Water Resources Research Editor's Choice Award from the American Geophysical Union. She is also a recipient of the Teresa Heinz Environmental Scholars Award.



WATER: AS WE DO NOT KNOW IT

Biman Bagchi

21 December 2019

In this talk, chemist Biman Bagchi invited the audience to explore the unique properties of water which make it a weird substance. His talk explored how the unique molecular properties of water give rise to its structural and dynamic behaviour. This in turn translates into its important role in biological and chemical processes. He also brought forth recent advances in the study of water in complex systems.

ABOUT THE CHEMIST /

Biman Bagchi is a chemist and an Amrut Mody Professor at the Solid State and Structural Chemistry Unit of the Indian Institute of Science. He is known for his studies on statistical mechanics; particularly in the study of phase transition and nucleation, solvation dynamics, mode-coupling theory of electrolyte transport, and dynamics of biological macromolecules, among other fields. He is an elected fellow of the Indian National Science Academy, the Indian Academy of Sciences and The World Academy of Sciences. Besides several scientific articles, he has authored two books, *Molecular Relaxation in Liquids* and *Water in Biological and Chemical Processes: From Structure and Dynamics to Function*.





Biman Bagchi delivers his lecture "Water: As We Do Not Know It."



While writing the history of a river, it was really challenging to remain confined to archives and conventional historical methods. I had to integrate findings from various disciplines like natural sciences and biological sciences into my work...

[I understood that] there has to be a democratic flow of ideas between various knowledge systems."

- Arupjyoti Saikia, historian

Arupjyoti Saikia delivers his lecture "The Unquiet River."



THE UNQUIET RIVER: BRAHMAPUTRA

Arupjyoti Saikia

28 December 2019

From landscapes to livelihoods, the river Brahmaputra has shaped the history of Assam. In this lecture, historian Arupjyoti Saikia brought together history, geology and hydrology to present a comprehensive understanding of this mighty river. He spoke about how the river was formed, what makes it unique, and why it is important to think about its future. His lecture was based on his book by the same name.

ABOUT THE HISTORIAN /

Arupjyoti Saikia is currently a Professor in History at the Department of Humanities and Social Sciences, IIT Guwahati. He has a Ph.D from the University of Delhi and was a postdoctoral fellow at Yale University. His research interests are primarily focused on the Economic, environmental and political history of modern Assam. His publications include *A Century of Protests: Peasant Politics in Assam since 1900*, Routledge, Delhi, 2014, *Forests and Ecological History of Assam, 1826-2000*, Oxford University Press, Delhi, 2011, among others.



CULTURAL IMMERSION: UNDERSTANDING CULTURE THROUGH WATER

K.Y. Narayanaswamy

04 January 2020

In this talk, Kannada writer K.Y. Narayanaswamy presented how our culture is tied so closely to water. Water is considered as one of the five elements. Civilizations throughout history have been born, flourished, and destroyed alongside the banks of rivers. All the oral narratives of the world refer to Earth as being born from water. The history of mankind is nothing but the narrative of the many uses of water. Particularly in the Indian context, water is understood as a matriarchal tradition in coexistence and conflict with the patriarchal Fire tradition. Throughout Indian society, the narratives, metaphors, epics, rituals, and folk beliefs surrounding water continue to reveal the unknown cultural politics.

ABOUT THE WRITER /

K.Y. Narayanaswamy is a Kannada poet, scholar, critic, and playwright. His many popular Kannada plays include *Pampa Bharatha*, *Kalavu*, *Anabhigna Shakuntala*, *Chakraratna*, *Kiavara Nareyana*, *Huliseere*, *Mallige*, *Maya Beete Male Mantrika* and *Vinura Vema*. He is credited with adapting Kuvempu's magnum opus *Malegalalli Madumagalu* into a 9-hour play. His works have won him three state Sahitya Academy awards. He also writes screenplays for films. His PhD thesis, *Neera Deevige* is considered a landmark in Kannada cultural studies of water. He is currently a Kannada professor at Maharani Cluster University, Bangalore.





K. V. Narayanswamy delivers his lecture "Cultural Immersion."

R. Shankar delivers his lecture "Ice on Earth."



ICE ON EARTH

R. Shankar

05 January 2020

In this talk, theoretical physicist R. Shankar spoke about how ice on earth, also called the cryosphere, is inextricably tied up with the climate of the earth. He explained how it affects all life on earth. This talk also explored why and how climate affects the ice. It further looked at questions, such as what caused the ice ages ? How did they affect the sea level? Why is this interplay of great concern today ? Finally, he presented a brief account of his research on Himalayan glaciers.

ABOUT THE PHYSICIST /

R. Shankar is a theoretical physicist. After a Ph.D. in particle physics, his research interests turned to quantum condensed matter physics. Along with this, he worked on tsunami modelling for some time. After that, combining his love for the mountains and physics he began working on Himalayan glaciers.

CLIMATE CHANGE AND WATER RESOURCES

Pradeep Mujumdar

11 January 2020

In this talk, hydrologist Pradeep Mujumdar looked at how climate change will most likely introduce an additional burden on the already stressed water systems in India. The talk presented the latest research on assessment of climate change impacts on regional hydrology, with emphasis on likely changes in water availability, agricultural water demands, floods and droughts and water quality. He also spoke about the challenges of assessing the impacts of climate change on water resources at different space-time scales.

ABOUT THE HYDROLOGIST /

Pradeep Mujumdar is currently serving as a Professor in the Department of Civil Engineering and as Chairman, Interdisciplinary Centre for Water Research. He has earlier served as the Chairman of the Department from November 2006 to December 2010 and as KSIIDC Chair Professor from August 2012 to July 2015. He holds an Associate Faculty position in the Center for Earth Sciences at IISc Bangalore. His area of specialization is Water Resources with a focus on climate change impacts on hydrology. He has served as the Chairman of the Water Resources Management section of the International Association for Hydro-Environment Engineering and Research (IAHR), and as a reviewer for the Assessment Report 5 (AR5) of the IPCC.



We need closely observe the increasing frequency of droughts and floods in our ecosystem, and understand how these extreme events influence water resources."

- Pradeep Mujumdar, hydrologist



Pradeep Mujumdar delivers his lecture "Climate Change and Water Resources."

“

Ecologists tend to think of remote areas like forests, and protected areas, when they talk about nature. The conversation about nature in the city tends to fall through the cracks, and we need to remedy this.”

- Harini Nagendra, ecologist

Harini Nagendra delivers her lecture "Bengaluru: City of Water."



BENGALURU: CITY OF WATER

Harini Nagendra
12 January 2020

In this talk, ecologist Harini Nagendra took the audience on a journey through the history of water systems in Bengaluru— starting from the 6th century CE to the present day. She explained how lakes were built and how they became an important source of water for the city. Today, they are used solely for recreation, environmental support and ornamental views. She argued that urbanization and water conservation can go together and that we need to look at our history to manage our future.

ABOUT THE ECOLOGIST /

Harini Nagendra is a Professor of Sustainability at Azim Premji University, where she anchors the Centre for Climate Change and Sustainability. Over the past 20 years, her research has examined people-nature relationships in forests and cities. For her interdisciplinary research and practice, she has received a number of awards including the 2009 Cozzarelli Prize from the US National Academy of Sciences, and the 2013 Elinor Ostrom Senior Scholar award, among others. Her publications include the books *Nature in the City: Bengaluru in the Past, Present and Future* (Oxford University Press, 2016) and *Cities and Canopies: The Tree Book of Indian Cities* (Penguin, 2019) as well as recent publications in *Nature*, *Nature Sustainability*, and *Science*. She writes regularly on public science issues in newspapers, and blogs.



WITHOUT WATER: BETWEEN LIFE AND DEATH

Shashi Thutupalli

19 January 2020

In this lecture, biologist Shashi Thutupalli questioned our understanding of life and death. His lecture was based on his exhibit *FrankenShrimp*, where dehydrated brine shrimp remain dormant until they are placed in water. Once in water, they begin their life processes. He spoke about how cells in living beings need to be in a liquid state to be active, highlighting the importance of water in life sustaining processes.

ABOUT THE BIOLOGIST /

Shashi Thutupalli is a Professor of Biology at the National Centre for Biological Sciences. His research program aims for a broad understanding of the origins and organization of living systems. Thutupalli's work is interdisciplinary combining experimental and theoretical techniques drawn from physics, engineering and biology.



“

My team and I are attempting to examine what happens to living organisms at the cellular level when they have to survive without water."

- Shashi Thutupalli, biologist



Shashi Thutupalli delivers his lecture, "Without Water: Between Life and Death."

“

His work is part of an ongoing investigation into the current state of nature, both as a crisis which traverses a political realm but also a cultural contestation of how ‘nature’ is thought of in the Anthropocene era.”

- U. Nair, journalist

Ravi Agarwal delivers his lecture "Relevance of Traditional Water Systems Today."



RELEVANCE OF TRADITIONAL WATER SYSTEMS TODAY: A CASE STUDY FROM THE THAR DESERT

Ravi Agarwal
19 January 2020

In this talk, artist Ravi Agarwal presented the relevance of traditional water systems. He began with an introduction to the concept of Anthropocene - the current geological age during which human activity has been the dominant influence. He later spoke about the Thar desert in Rajasthan and how the traditional water management systems were taken over by the Indira Gandhi Canal. Through his talk, Ravi argued for learning from these traditional systems in designing and implementing future developmental plants.

ABOUT THE ARTIST AND ACTIVIST /

Ravi Agarwal has an interdisciplinary practice as an artist, photographer, environmental campaigner, writer and curator. His work explores key contemporary questions of ecology, society, urban space and capital. Photography has been a prime medium for him for over four decades, which has expanded over time to include video, public art, installations, and recently also printmaking. His work has been shown widely including at the Yinchuan Biennial, Kochi Biennial, and the Sharjah Biennial, among other. He co-curated the Yamuna-Elbe project, Indo German twin city public art and ecology project (2011), and Embrace our Rivers an Indo- European project in Chennai (2018).

WATER AND HUMAN SETTLEMENTS

Gajanana Sharma

25 January 2020

In this talk, Kannada writer Gajanana Sharma presented his perspective on the connection between water and human settlements. The first part of his talk looked into the history of how humans choose a place to live based on the presence of rivers. This meant that civilizations were born on the banks of the river. In the second half of the talk, he questioned our current craze to move rivers as per our will and bring their water to our habitats instead. He illustrated this through the example of the proposed project to divert the water of river Sharavati to Bengaluru.

ABOUT THE WRITER /

Gajanana Sharma is a prominent Kannada writer. He has a master's in technology and has worked as Chief Engineer in the Karnataka Electricity Board. He is also an activist for children's theatre and has directed many dramas. He has written about the 100 years of the history of electricity in Karnataka and frequently writes dialogues for many films including the national award winning film *Dweepa*.





Gajanan Sharma delivers his lecture "Water and Human Settlements."

K. S. Valdiya delivers his lecture "The Disappearance of the Saraswati."



THE DISAPPEARANCE OF THE SARASWATI

K.S. Valdiya
26 January 2020

In this talk, prominent geologist K.S. Valdiya presented a talk on the mythical river Saraswati in Western India and took audiences on a journey through time. By providing evidence of human activity along its course and images of underground water challenges, Valdiya argued that the river existed up until the 2000 years ago. He ended his lecture by proposing that tectonic fault lines changed the course of the river and pushed the remaining part of it underground.

ABOUT THE GEOLOGIST /

K S Valdiya (1937–2020) was a distinguished scientist, academician, author, and an active environmentalist. He was internationally recognised for his path-breaking work in the fields of Geology and Environmental Science. In 2007, he was awarded the Padma Shri for his outstanding contribution to Science. His field of specialisation was Tectonics with special reference to active faults and Environmental Geology. He wrote over 110 research papers, authored 14 books, edited 9 books, and penned 40 articles in Hindi towards popularisation of science.

INDIA'S WATER PROBLEMS HAVE SIMPLE SOLUTIONS

Mihir Shah

29 January 2020

In this talk, policy-maker Mihir Shah argued that contrary to popular belief, the current water crisis in India is amenable to solutions that are both reasonably simple and practically implementable. The talk summarised the key elements of a new water strategy and demonstrated how its implementation can be carried out. Based on a radically new understanding of development, this water strategy is absolutely essential, given the emerging reality on the ground in this era of climate change, as also our growing understanding of water and its place in the development process.

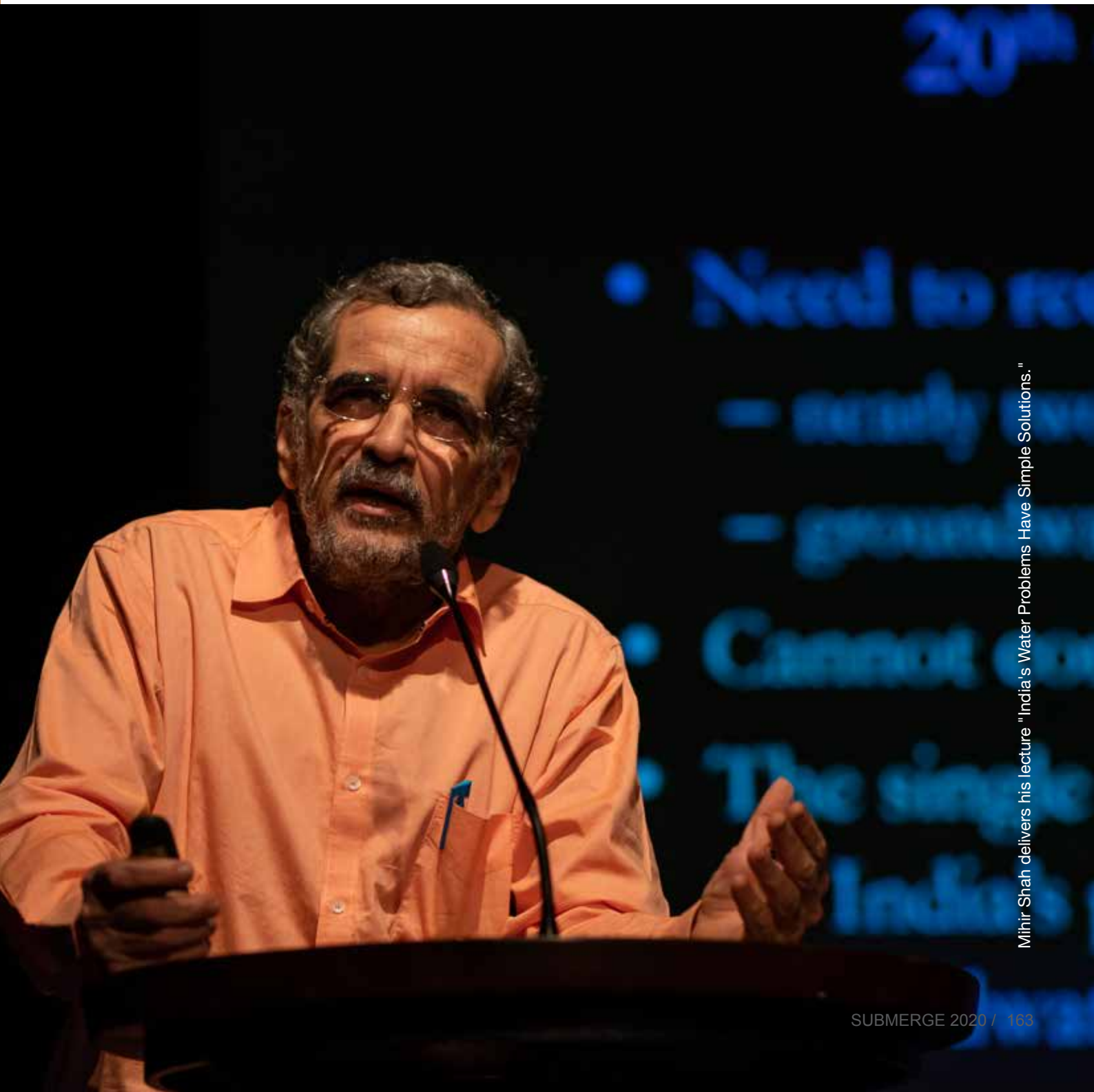
ABOUT THE POLICY-MAKER /

As Member, Planning Commission, Government of India from 2009 to 2014, Mihir Shah was chiefly responsible for drafting the paradigm shift in the management of water resources enunciated in the 12th Five Year Plan. In 2017-18, he chaired a Task Group set up by the Government of Karnataka, that submitted a new Water Policy in December 2018. In November 2019, he was asked by the Government of India to chair the Committee to draft a new National Water Policy.

“

We imagine that India's water problem is impossible to resolve. But India is a water abundant country, and the problem lies in the way that water is managed."

- Mihir Shah, policy-maker



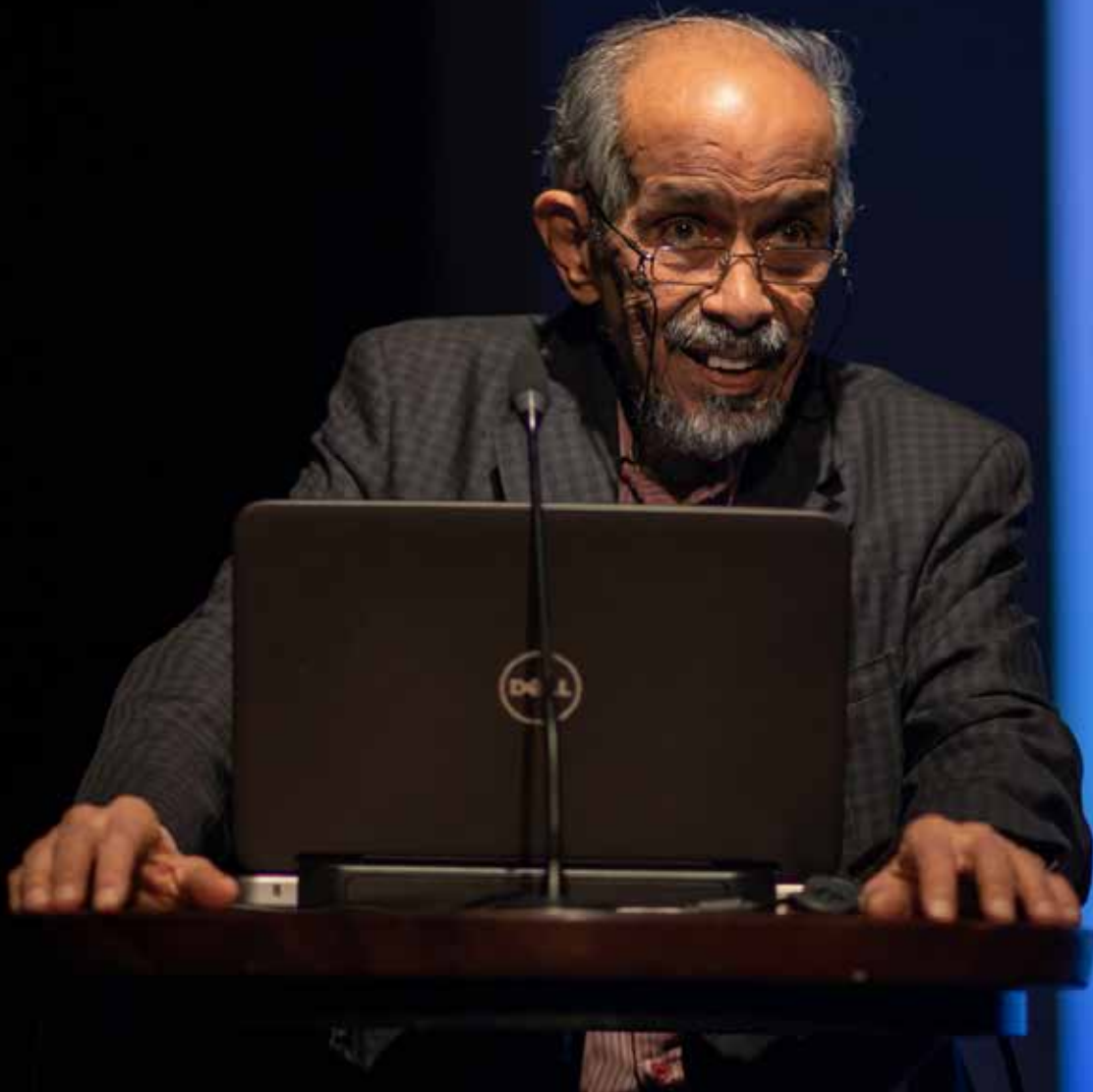
Mihir Shah delivers his lecture "India's Water Problems Have Simple Solutions."

“

Cumulus clouds are very familiar to all of us. But my team and I are attempting to understand how they are formed in the skies, and how we can simulate them in a lab and on a computer."

- Roddam Narasimha, fluid dynamicist

Roddam Narasimha delivers his lecture "The Mystery of the Cumulus Clouds."



THE MYSTERY OF THE CUMULUS CLOUD

Roddam Narasimha
30 January 2020

In this talk, fluid-dynamicist Roddam Narasimha presented his work with Cumulus clouds. Cumulus clouds are those clouds which have a flat base but are large and fluffy. He began by sharing his fascination with clouds, which began at an early age. A firm believer in the trans-disciplinary nature of knowledge, he presented examples from classical Indian literature and art depicting clouds. In the second half of the lecture Narasimha gave the audience a flavour of scientific rigour and the extent of details involved in his work in fluid dynamics. He proceeded to tell the audience about how they can be created artificially in a laboratory.

ABOUT THE SCIENTIST /

Roddam Narasimha (1933–2020) was the Chairman of the Engineering Mechanics Unit at the Jawaharlal Nehru Centre for Advanced Scientific Research, and the Director of the National Institute of Advanced Studies, Bangalore. He was awarded the Padma Vibhushan, India's second-highest civilian award, in 2013. He was an aerospace scientist and fluid dynamicist who also held the Pratt & Whitney Chair in Science and Engineering at the University of Hyderabad.

TUTORIALS



Veena Srinvisan conducts her tutorial.



Harini Nagendra interacts with participants at her tutorial.



“

The tutorial session was amazing because the students came from different backgrounds, but they had a good understanding of the topic that I spoke about. I would value this experience much more than just delivering a lecture in a classroom.”

- Pradeep Mujumdar, hydrologist



Participants interact with Shashi Thutupalli at his tutorial.



Participants of Harini Nagendra's tutorial.

SOAK

7 Films

Our film festival *Soak* was curated by filmmaker Surabhi Sharma. We screened several films which closely examined the relationship communities share with water around the world. The screenings were followed by a discussion with film-makers and scholars.



ABOUT THE CURATOR /

Surabhi Sharma is a filmmaker based in Abu Dhabi and Mumbai. She has worked on several feature length documentaries apart from some short fiction films and video installations. Her key concern has been documenting cities in transition through the lens of labour, music and migration, and most recently reproductive labour. Cinema verite and ethnography are the genres that inform her filmmaking. She is currently teaching in the Film and new Media Programme at New York University Abu Dhabi.



THE EBB TIDE

20 December 2019

Director: Renu Savant

Duration: 60 minutes

Language: Marathi, English

Year of production: 2019

The first film to be featured at the Soak Film Festival was *The Ebb Tide* by film-maker Renu Savant. A Marathi documentary film, 'The Ebb Tide' follows the monsoon in the creek of Mirya village. The film is a documentation of its fisherfolk, recording their unfolding presence and fishing work. It brings out their working rhythms, dreams and desires, generational legacies of hard labour and their relationships to the sea and the fish as a sacred natural resource.

This screening was followed by a discussion between filmmaker Renu Savant and academic Arul Mani.

ABOUT THE FILMMAKER /

Renu Savant is a film-maker. She holds an MA in English Literature and worked as a journalist with Indian Express, a Lecturer in Royal College and assisted senior artists and practitioners. She joined the Film and Television Institute of India, Pune as a student of film direction and won two National awards – Special Mention in 2012 and Golden Lotus for Best Direction in 2015 for her short films made in FTII. After graduating she got the Early Career Fellowship from the Tata Institute of Social Sciences, SMCS. Through this fellowship Savant completed her first long duration film, a 4-hour video chronicle – *Many Months In Mirya*. Currently she works in and around Mumbai and Ratnagiri, on western coastal Maharashtra.



ABOUT THE ACADEMIC /

Arul Mani is a Professor of English at the St. Joseph's College, Bengaluru. With a teaching experience of 25 years, his interests include curriculum design, examination reform, world literature, stylistics, the graphic novel, long-form journalism, and Latin American literature. He received his Ph.D from Bangalore University in 2008.



Still from Renu Savant's film *The Ebb Tide*, dir. 2019.





Renu Savant discusses her film with Arul Mani.

LADY OF THE LAKE

27 December 2019

Director: Haobam Paban Kumar

Duration: 71 minutes

Language: Meitei

Year of production: 2016

Lady of the Lake is a Manipuri film directed by film-maker Haobam Paban Kumar. It is set in a fishing community living on floating biomass in Loktak Lake in Manipur. They were ousted from their houses by government intervention in 2011 and houses were destroyed and destitute villagers were forcibly relocated. It follows the life of a couple from the community and what happens to their lives after the accidental discovery of a gun.

This screening was followed by a discussion between the filmmaker Haobam Paban Kumar and academic Nitya Vasudevan.

ABOUT THE FILMMAKER /

Haobam Paban Kumar is an Indian filmmaker from the state of Manipur. Kumar's films and documentaries have been screened in several places across the globe. Kumar's debut feature film Loktak Lairembee (*Lady of the lake*) won the National Film Award for Best Film on Environment Conservation/Preservation at the 64th National Film Awards, 2016. He also won 'German Star of India' at the 14th Indian Film Festival in Stuttgart, Germany for the film in 2017. Kumar's documentary '*AFSPA 1958*' in 2006 was one of the highly critical and widely appreciated films across the globe for his daredevil attempt to showcase the harsh reality of the ill effects of the Arms Forces Special Power Act in Manipur state.



ABOUT THE DISCUSSANT /

Nitya Vasudevan is a faculty member at the School of Arts and Sciences and joined Azim Premji University in 2020. Before this she worked for five years at Baduku Community College (an initiative of the NGO Samvada, in Bangalore) as faculty at the Centre for Wellness and Justice, and as Convener of the Kanaja: Knowledge and Resource Centre at Samvada. She completed her PhD in Cultural Studies at the Centre for the Study of Culture and Society (Bangalore)/Manipal University. Her teaching history includes courses on Literary and Cultural Studies, Gender Studies, Research Methodology and courses on Wellness and Justice. She has also been a co-director of the *Bangalore Queer Film Festival* since 2009.



Still from Haobam Paban Kumar's film *Lady of the Lake*, dir. 2019.





Haobam Paban Kumar discusses his film with Nithya Vasudevan.

JAMNAPAAR

3 January 2020

Director: Abhinava Bhattacharyya

Duration: 24 minutes

Language: Hindi

Year of production: 2017

Jamnapaar is a Hindi documentary film by filmmaker Abhinava Bhattacharyya. The film lurks on the Yamuna's edge seeking to explore how the inhabitants of the Yamuna relate to its degraded presence, the fragile nostalgia of an unknowable past and the horror of its unthinkable future.

The screening was followed by a discussion between directors Abhinava Bhattacharya, Prantik Basu, and academic Nithin Manayath.

ABOUT THE FILMMAKER /

Abhinava Bhattacharyya is a freelance filmmaker and lives in Delhi. He is an alumni of the Creative Documentary Course at the Sri Aurobindo Centre for Arts and Communication (SACAC). He has been working and trying to gain experience in the different disciplines of filmmaking for the past few years. A deep curiosity in the discipline of visual storytelling along with the need to express drives him to explore the thin crack that runs between documentary and fiction, between reality and madness.



ABOUT THE DISCUSSANT /

Nithin Manayath is a Professor of Communications at Mount Carmel College, Bengaluru. He is also the co-organiser and curator of the *Bangalore Queer Film Festival*.



A still from *Jamnapaar*. Dir: Abhinava Bhattacharyya, 2017.

RANG MAHAL

3 January 2020

Director: Prantik Basu

Duration: 27 minutes

Language: Santhali, English

Year of production: 2020

Rang Mahal by filmmaker Prantik Basu follows the life of the Santhali tribe in Purulia, West Bengal. Until recently they had no written script, their stories and myths preserved and passed orally through generations. Each narration would assume a different form, much like the rocks of a nearby hill that come in various hues. The film is a tale about the origin of creation, exploring the unique relationship of the Santhali people with nature and culture.

This screening was followed by the screening of *Jamnapaar* and after that a discussion was organised between director Prantik Basu, filmmaker Abhinava Bhattacharya and academic Nithin Manayath.

ABOUT THE FILMMAKER /

Prantik Basu studied film direction and screenplay writing at the Film and Television Institute of India, Pune. A filmmaker by practice, Prantik has been making short films and experimental documentaries since 2007. His student short *1,2* (2011) received the Indian Jury Prize at the Mumbai International Film Festival in 2012. His films, *'Wind Castle'* (2014) and *'Makara'* (2013) have been screened at various film festivals including Oberhausen, Rome Film Festival, Experimenta & Kochi-Muziris Biennale.



ABOUT THE DISCUSSANT /

Nithin Manayath is a Professor of Communications at Mount Carmel College, Bengaluru. He is also the co-organiser and curator of the *Bangalore Queer Film Festival*.



Still from Prantik Basu's film *Rang Mahal*, dir. 2020.



SUBMERGE



Prantik Basu and Abhinava Bhattacharya discuss their films with Nithin Manayath.

REMEMBERING KURDI

10 January 2020

Director: Saumyananda Sahi

Duration: 64 minutes

Language: English

Year of production: 2016

Remembering Kurdi is an English documentary film, which witnesses the brief resurfacing of a census town submerged for three decades by the Salaulim dam, in Goa. Through the explorations of a young man and woman in search of their ancestral home and history, the film is an allegory for the universal quest to preserve memory and so also a sense of belonging.

This screening of the film was followed by a discussion between Gurucharan Kurdikar, an inhabitant of Kurdi and academic Rashmi Sawhney.

ABOUT THE DIRECTOR /

Born in Bangalore, Karnataka, in 1986, Saumyananda Sahi was the youngest participant in the Talent Campus India (2004), and the Berlinale Talent Campus at the Berlin International Film Festival (2005). Over the last ten years Saumyananda has worked on both documentaries as well as fiction features with filmmakers such as Thomas F. Lennon, Kamal Swaroop, Arun Karthick, Anamika Huksar and Anne Aghion. His work has been screened in Film Festivals around the world, including at Sundance, Rotterdam, Locarno, Hot Docs and IDFA.



ABOUT THE DISCUSSANTS /

Gurucharan Kurdikar was an inhabitant of Kurdi. He has vivid memories of his childhood in Kurdi but is based in Mumbai.

Rashmi Sawhney is a Bangalore-based academic and writer whose work deals with cinema and visual culture. She is currently Associate Professor in Cultural Studies at Christ University, Bangalore. Rashmi lived in Ireland for eleven years, where she did her PhD and later took up a Lectureship at the Centre for Transcultural Research and Media Practice (www.ctmp.ie). Prior to joining Christ University, she was Associate Professor at the School of Arts and Aesthetics, Jawaharlal Nehru University, Delhi.



A still from Saumyananda Saha's film *Remembering Kurdi*, dir. 2016.

15.12.19–30.01.20

SUB MERGE





Rashmi Sawhney in conversation with Gurucharan Kurdikar.

INLAND SEA

15 January 2020

Director: Kazuhiro Soda

Duration: 122 minutes

Language: Japanese

Year of production: 2018

Inland Sea is set in Ushimado, a remote fishing village in Japan. Through black and white photography, it depicts the twilight days of the village and its people by the inland sea. Through a mix of vérité shots and direct conversations, Soda shows that these tenacious residents are so much more than remnants of a dying way of life.

Post the screening, there was an informal discussion between the audience, filmmaker Hansa Thapliyal and academic Nitin Manayath.

ABOUT THE DIRECTOR /

Kazuhiro Soda is a Peabody Award winning filmmaker. He practices an observational method of documentary filmmaking based on his own "Ten Commandments" which prohibits him from doing pre-shoot research or writing a synopsis before filming. He is also the author of seven books published in Japan. He taught at the University of Michigan as a visiting professor from 2016 till 2017.



ABOUT THE DISCUSSANT /

Hansa Thapliyal is a filmmaker and writer who has worked with material, seeking new ways of making. She is also a teacher and workshop facilitator. She has worked previously on digital archiving and collaborated on a creative project on early Indian cinema. She has worked across fiction and non-fiction forms. Lately, her work has begun integrating stop motion and animation, in an attempt to make the screen feel more material.



A still from Kazuhiro Soda's film *Inland Sea*, dir. 2018.

A RIVER CALLED TITAASH

3 January 2020

Director: Ritwik Ghatak

Duration: 159 minutes

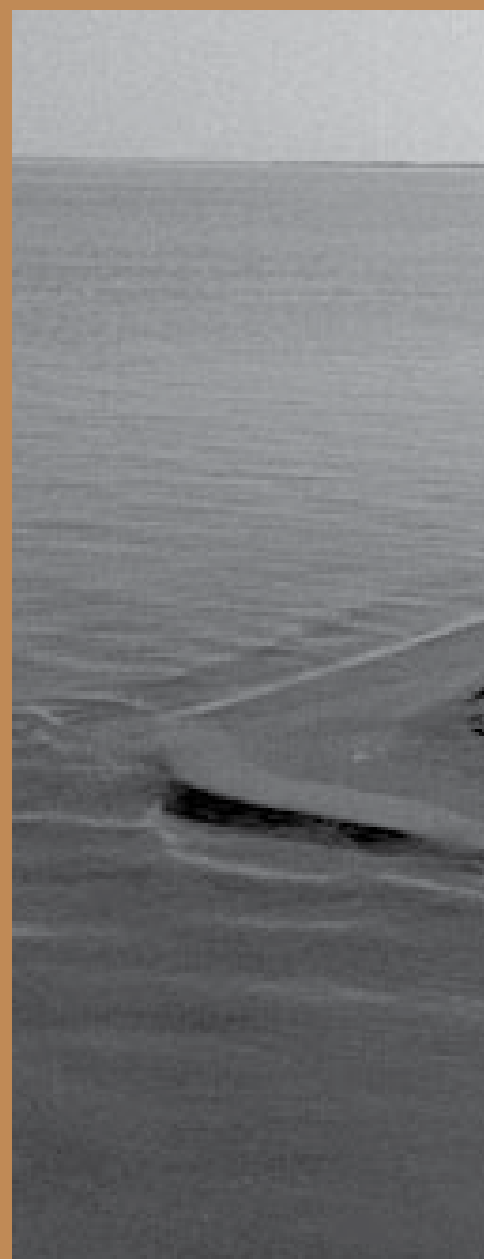
Language: Bengali with English subtitles

Year of production: 1973

A River Called Titaash, is a Bengali film directed by Ritwik Ghatak. The movie was based on a novel by the same name, written by Adwaita Mallabarman. The movie explores the life of the fishermen on the bank of the Titas River in Brahmanbaria, in undivided Bengal, now Bangladesh.

ABOUT THE DIRECTOR /

Ritwik Ghatak (1925 – 1976) was an Indian film director, screenwriter, and playwright. Along with prominent contemporary Bengali filmmakers Satyajit Ray and Mrinal Sen, his cinema is primarily remembered for its meticulous depiction of social reality, partition and feminism. He won the National Film Awards Rajat Kamal Award for Best Story in 1974 for his '*Jukti Takko Aar Gappo*' and Best Director's Award from Bangladesh Cine Journalist's Association for '*Titash Ekti Nadir Naam.*'



ABOUT THE DISCUSSANT /

Gouri Patwardhan is an Indian filmmaker. She has received the National Award for her documentary film 'Modikhanyachya Don Goshti' (Two tales of Modikhana) in the Non Feature Film category for Best Arts / Culture film at the 60th National Film Awards. She is an alumna of Film and Television Institute of India (FTII), where she studied film editing.



A still from Ritvik Ghatak's film *A River Called Titash*, dir. 1973

MEDIATORS

A photograph of a museum gallery. In the foreground, the silhouettes of several people are visible against a dark background. In the middle ground, a man with glasses and a grey jacket stands looking towards the camera. Behind him, a large circular display shows a reddish celestial body, likely Mars. To the right, another circular display shows a globe of the Earth. The lighting is dramatic, with the displays and the man in the middle ground being the primary light sources.

Mediators are integral to Science Gallery Bengaluru public engagement programme. Selected from our target audience of young adults, they are responsible for driving the experience on the exhibition floor. They engage and provoke visitors into a conversation sparked by our exhibits, events, and programmes.

Our Mediators belonged to a variety of academic backgrounds and were typically current undergraduate or postgraduate students. They went through multiple training sessions with our team and participating artists and researchers, working on their skills of communication and public engagement.



“

Being a mediator means being a guide and a good conversationalist. It's not easy to break down scientific topics into information that can be easily understood. But having a visitor understand, and ask questions is extremely rewarding.”

- Yamini Srikanth, mediator

“

It's so refreshing to think about science through cultural, social, economic and political prisms. I had not expected public engagement to be so spiritually satisfying.”

- Akif Khan, mediator



Mediator shows visitors Debasis Sengupta and G. S. Bhatt's
The Rotating Table, n.d.





Top R and L: Medistors show visitors Steven Tevel's *Sounds Tapper*, 2019.



Mediator shows visitors Jennifer Wightman's *Munsell Richter*, 2019.

Aarushi Susheel
Abhishek Jain
Abigail Silversmith Irfan
Akif Khan
Aman Anand
Anagha Nadig
Ananthapadmanabhan
Aryaman Sharma
Ashwini Anil
Bevan Stanley
Bina R
CM Manasvi
Gauri Gharpure
Govind Patilla
Jay Kulkarni
Janhavi Bodele Suresh
Lakshya Nahar
Manish Jayashekar
Maya Ramachandran
Meghana Binraj
Mitreya Vellala
Niranjan Krishna Kumar
Prajwel Joseph
Priya B R
Rahul Keshav
Rajas Poorna
Rebecca Tom
Rishan Ahamed
S. Partheeban
Shrivathsa M S
Sri Vrushank Ayyagari
Vinay Anand
Yamini Srikanth
Yamini Undurthi

TAKE IT FURTHER



In SUBMERGE, we endeavoured to provoke visitors to explore the concepts in exhibition beyond the exhibits and programmes. In collaboration with Atta Galatta, we put together a set of reading materials which explored the role of water in our lives beyond its utilitarian value in the Reading Room. As a part of our Good Books event, we invited young adults to converse with environmental historian Aryupjoyoti Saiki about his timely book on the Brahmaputra river, *The Unquiet River*. We also invited our visitors to engage with the artists at SUBMERGE, to get a deeper understanding and appreciation of their work in our Meet the Artists event.



Display of Jyoti Bhatt and T. S. Satyan's *People and Water*, 2019.
Photographs provided by the Museum of Art and Photography, n.d.

READING ROOM /

At every exhibition we create a reading room, which is a space for visitors to come sit and read books that shed light on various perspectives and insights about the theme of the exhibition. We curated the Reading Room for SUBMERGE, with support from Atta Galatta. It included a selection of reading materials from classics like Moby Dick and Meghadoot to nonfiction titles like The Cloud Spotter's Guide.

GOOD BOOKS /

We organised a book reading and discussion session with historian Arupjyoti Saikia. The session started with Arupjyoti reading out sections from his book 'The Unquiet River: Brahmaputra'. After the reading, the audience engaged in a free-flowing conversation about the themes of the book, what makes Brahmaputra unique and how current policies are affecting the river.

MEET THE ARTISTS /

We conducted a 'Meet the Artists' session with artist Oren Ailam and Ivan Macera. Visitors joined the session to engage in an informal discussion with the artists. They learned about their artistic journey, things which inspire them and what keeps them going.

PITCH SESSION /

This session was organised in partnership with the Bengaluru Sustainability Forum (BSF). In December 2019 BSF had announced its first ever open call for the Small Grants Programme around the areas of urban water, urban biodiversity, urban climate change or the linkages between them. The shortlisted proposals were invited to convince the jury why they should be awarded the grant. Applicants and the audience got a chance to see other applicants pitches, which gave rise to some spontaneous ideas for collaboration.

CLOSING EVENT

E. V. Ramana Reddy delivers closing remarks at the closing event of SUBMERGE.





The closing event of SUBMERGE began with a public lecture on the 'Mystery of the Cumulus Cloud' by fluid-dynamicist **Roddam Narasimha**.

Moulik D. Berkana, Cultural Affairs Officer, U.S. Consulate General shared his experience of attending the exhibition and highlighted the importance of public engagement with water issues.

A note on the future plans of Science Gallery Bengaluru was presented by **E V Ramana Reddy, Additional Chief Secretary at the Department of Information Technology, Biotechnology, Science and Technology, Government of Karnataka**.

Finally, our **Founding Director Jahnvi Phalkey** closed the event with a note of thanks.

COLLABORATORS

CONTENT PARTNERS



PROGRAMME PARTNERS



READING ROOM PARTNER



ARTISTS

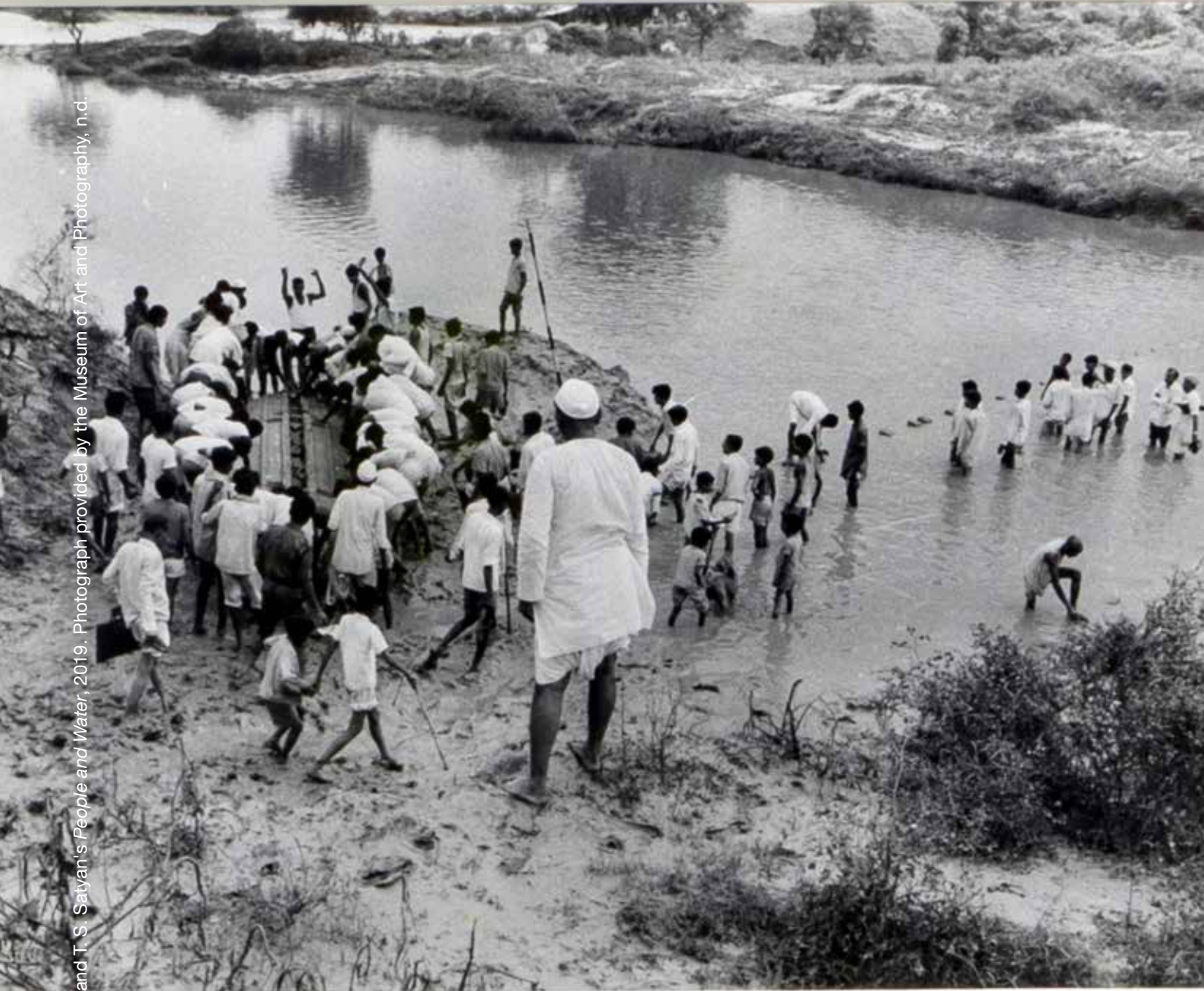
Alex May
Anna Dumitriu
Brian House
Chirantan Khastgir
Debasis Sengupta
G. S. Bhat
Harpreet Sareen
Ivan Macera
Jenifer Wightman
Oren Ailam
Shashi Thutupalli
Shi Weili
Steven Tevels
Suresh Kumar

FACILITATORS, SPEAKERS AND FILMMAKERS

Abhinava Bhattacharyya
Amit Tandon
Anil Menon
Arul Mani
Arup K. Sengupta
Arupjyoti Saikia
Biman Bagchi
Dorota Borowa

Gajanana Sharma
Gouri Patwardhan
Gurucharan Kurdikar
Hansa Thapliyal
Haobam Paban Kumar
Harini Nagendra
Jagdish Krishnaswamy
K. Y. Narayanaswamy
K. S. Valdiya
Kazuhiro Soda
Krithika Ramchander
Mihir Shah
Nithin Manayath
Nitya Vasudevan
Pradeep Mujumdar
Pranay Lal
Prantik Basu
R. Shankar
Rahul Ram
Rama Govindarajan
Rashmi Sawhney
Ravi Agarwal
Renu Savant
Roddam Narasimha
Shashank Srinivasan
Shashi Thutupalli
Srikanth Sastry
Surabhi Sharma
Trevor Birkenholtz
Veena Srinivasan
William Pennock

TEAM



Jyoti Bhatt and T. S. Satyan's *People and Water*, 2019. Photograph provided by the Museum of Art and Photography, n.d.



ACADEMIC ADVISORS

Roddam Narasimha
S. Vishwanath
Srikanth Sastry

CURATORIAL PANEL

Jahnvi Phalkey
Doug Herman
Abhishek Hazra

EXHIBITION DESIGN

Anitha Balachandran
Meera Krishnamurthy
Siddhartha Chatterjee and
SeeChange.in team

EXHIBITION PRODUCTION

Laxmi Jag
Pavneet Pal Singh
Shyam Patel
Rajendra Mistry & team

LIGHTING PRODUCTION ASSISTANCE

Parthasarathi S.
Sridhar Murthy and the Work House team

PROGRAMMES

Ashwini Petchiappan
Madhushree Kamak

MARKETING, MEDIA AND COMMUNICATIONS

Ishani Chaudhary
Neha Arora
Komal Jain

DOCUMENTATION

Whistleman Films Team:
Anandhu Madhu
Arun C B
Ghanshyam
Kiran Keshav

ON-GROUND SUPPORT AT BANGALORE INTERNATIONAL CENTRE

Raghu Tenkayala
Lekha Naidu
Rajashekhar B N
S Saravana Raj
Manas Sampath

SUBMERGE

VISIT THE EXHIBITION ARCHIVE AT
www.bengaluru.sciencegallery.com/submerge



SCIENCE GALLERY BENGALURU

   @SciGalleryBlr