# MAPPING A pamphlet of physics poems THE created as part of the 2023 Institute of Physics Writing Residency DEPTHS **OFUS Chandrika Narayanan-Mohan**

Physics was my weakest subject in school. I loved stargazing with my mother, I loved all the worlds that physics held within itself. However, due to the way it was taught in my school I felt shut out of a subject I admired so much, not knowing that anyone can approach physics from any number of angles and disciplines.

I had excellent grades otherwise, and the thought of failing was terrifying to me. A recent diagnosis of autism and ADHD has also helped me realise why back then I excelled in some subjects and with certain teachers, and struggled in others.

However, I now realise I was looking at it all wrong. To create this booklet I interviewed five physicists, some working in physics and some using their scientific knowledge in a different field. *Try again. Fail again. Fail better* said Samuel Beckett, understanding the scientific method more than I ever did in six words. I now understand that curiosity and adversity are lifelong companions, and a life without failure is a life without enquiry, without curiosity, and without discovery.

Curiosity has been the engine that has propelled me to this point, though for many years it was stifled due to the legal constraints, stress, and emotional devastation that comes with being a non-EU immigrant in Ireland. In 2019, after seven years of being legally prevented from pursuing work outside my one full-time job, I was finally granted permission to live and work freely in Ireland. This freedom reignited my love for science communication through art, and allowed me to pursue new paths.

Those paths led me to this moment. It's 2023 and I am the inaugural Writer-in-Residence for Institute of Physics (IOP). My focus in this role has been to investigate the relationship between poetry and science communication, while platforming voices from backgrounds and identities underrepresented in STEM, and bringing my whole self to the process. This pamphlet is the culmination of that work. Like physicists, like neurodivergent people, like immigrants, like artists, some of the poems in this booklet look like how you expect poems to look, but many don't. There are erasure poems, found poems, poems inspired by TV shows, and poems that are probably not even poems. With this work, I wanted to explore the human aspects of scientific research by responding to people's stories and generating new art that hopefully resonates with readers regardless of their fields of interest.

Thank you to the Arts Council of Ireland for funding this residency through a Literature Project Award. Thank you to my interviewees Temilade Adegoke, Femi Bankole, Rucha Benare, Linda Hughes, and Dr Siddhi Joshi, the poems would not exist without your generous stories. Thank you to Ruth Saunders for inviting me give a workshop as part of the TAP Summer School, and to NI Science Fest and Dublin Book Festival for including my events in their programmes. And biggest thanks to the IOP team, especially Fiona Longmuir and Elora McFall for their support, and in particular IOP Public **Engagement Manager Brendan Owens** who has supported my science and poetry dreams since we met as part of the Science Gallery Dublin Rapid Residency where this all began, and enabled this entire idea to happen.

Chandrika Narayanan-Mohan

To create my poems for this residency, I interviewed physicists (mostly from the IOP network) and wrote poems based their stories. Instead of writing poems directly about physics I wanted to write about the human side of the research process. I asked my interviewees to tell me about their careers, their high points and low points, pivotal moments and challenges, and selected key moments to turn into poems. When choosing interviewees, I specifically wanted to talk to people from minoritised backgrounds that are underrepresented in STEM, but also wanted to make sure they did not feel pressured to discuss diversity in any way and focus on their work and interests instead. Thank you so much Rucha, Temi, Femi, Siddhi and Linda for your stories, and to Brendan Owens for sending the IOP physicists my way.



**Temilade Adegoke** is a Post doctoral researcher at the University of Limerick (UL), investigating fundamental atomic and electronic structure properties of novel 2-D ferroelectrics (FEs) for the advancement of next generation nanoelectronics. Her research focuses on obtaining 2-D FEs by exfoliation of bulk crystals, followed by atomic-scale structural and spectroscopic investigations of the 2-D FEs. She employs state-of-the art Transmission electron microscope (TEM), conducting experiments under various in-situ conditions including heating, biasing, and atmospheric environment.

Temilade holds a PhD in Materials Science from the University of Limerick under the Supervision of Prof. Kevin M. Ryan and Prof. Ursel Bangert. Her research, funded by SFI focussed on solution-based synthesis and applications of high throughput 1-D nanostructures combined with in-situ heating and liquid cell TEM investigations.

In 2018 she obtained a distinction MSc degree in Applied Physics from UL during which her MSc project focused on defect analysis in doped 2-D nanomaterials using computer simulated atomic resolution electron microscope images. Her academic journey began with an undergraduate degree in Physics and Electronics at the Federal University of Technology Akure, Nigeria, reflecting her passion for science.



**Rucha Benare** is a biomedical engineering research student with a passion for rediscovering myths, biophysics, psychology, and poetry while living in different places and continents. Her heart currently oscillates between Ireland and India; chai and spice bags are her constant companion as she works on projects such as art book on biomechanics for charity and organ-on-chip technology.



**Linda Hughes** is a Met Éireann Meteorologist. She began her career in weather forecasting in 2013, working as a marine forecaster and shipping route analyst in Scotland. She holds an RMet accreditation awarded by the Royal Meteorological Society. Since joining Met Éireann, she has worked in both aviation and general forecasting. Part of her role involves preparing and presenting weather forecasts on RTÉ television and radio.

Linda is from Oughterard in County Galway and attended St. Annin's National School, Rosscahill, followed by Salerno Secondary School, Galway. During school, she had a keen interest in maths and physics, so decided to study Science in NUI Galway, specialising in Experimental Physics. She then went to the UK to complete a Master's degree in Applied Meteorology at the University of Reading.

From an early age, music has been a huge part of Linda's life. She plays piano and violin and was a member of the Galway Youth Orchestra, the NUI Galway Orchestra and the Aberdeen Chamber Orchestra. She now enjoys playing fiddle in Met Éireann's traditional music group called 'Ceo' and singing in the Met Éireann choir 'The Isobars'. Her other interests include reading, art and swimming. She also loves spending time with friends and visiting her family in the west of Ireland.



Dr Siddhi Joshi is a marine biogeoscientist and oceanographer based in London. She is of Indian origin and spent 11 years living in Galway,Ireland where she did her PhD. She was inspired by learning about the multidisciplinary science of oceanography including the biological, chemical and physical oceanography, marine geology and marine geophysics. The seafloor is full of diverse range of species and marine habitats and Siddhi got into the science of habitat mapping during a placement in Canada and later in Ireland during her PhD. Oceanography is such a global science that one gets to meet people from all walks of life - most oceanographers have a deep connection to nature and the spirit of discovery. INSPIRED BY DR SIDDHI JOSHI

In her geophysical work mapping the sea floor, Siddhi mentioned that acoustic and sonar is used to create these images. Siddhi also plays bass guitar in a band called The **Confusion Dilemma** as part of Girls Rock London, where she wrote a song called 'Pacifist Piranha' (the final line is a lyric from her song). In this poem Siddhis' two worlds are brought together, united by the power of sound.

## Sonar

A steady rhythm fingers press on thick strings *twang boom bass* things fit together melody and beat

From the rehearsal room to machine screens sound tells a story *ping whistle squeak* mapping the depths of us

A song is born from the sea floor from blood, from pores from years of swimming against the current *I have to find a way* come what may INSPIRED BY

During our conversation, Linda often said that she hopes her public presence in the media, where she regularly mentions her academic background in meteorology, inspires more girls to pursue careers in that field.

# Oracle

Girls aren't supposed to play with storms but I am wound around them, their intricacies, soft breezes and brutalities. Why wouldn't this be a place for a girl? Surely we belong in the eye of things, in the precision point of potential destruction, haven't we always been seer, soothsayer, truthteller, Cassandra? Eyes always on things that shift, that flow, that rise and fall, the patterns of the world. Mouthpiece for foretelling, numbers and statistics flowing from fingertips, all lipstick and research. I hope they see me, messy pigtails, diamond-eyed, lightning-brained, I hope they point at the screen and ready themselves, curiosity ignited, prepared to step into a world of wind and blaze, salted equations, dark water and sky.

#### INSPIRED BY RUCHA BENARE

This poem reflects the hypocrisy, misogyny, and lack of diversity in certain fields of STEM that Rucha experienced during her time working in a lab in Switzerland. It compared starkly with her experience sharing accommodation with other scientists from different parts of the world, and the supportive atmosphere of a diverse scientific community.

### **Alpine Snow**

Yes, my body has a place here,

in the lab, amongst pale skin and 5 o'clock shadows, wrinkled brows when I am witnessed, the wrongness of me, one of two women amongst 25 men baffled at our presence, raised eyebrows and huffing impatience.

In the apartment it's another world: Columbia, India, Bulgaria, languages and laughter, shades of pale to brown, commiserations and comradery, plates piled high, music in every room, hot chai and salad and all nighters, breaking ground and new frontiers crossed to the soundtrack of Daddy Yankee and Pitbull.

Yes, my body has a place here.

INSPIRED BY TEMILADE ADEGOKE

Temi shared how many moments of clarity she has experienced over biryani and game nights with her international group of researchers. Their often led her in new directions, and she has even found ways for her research to be applied to their work. It is interesting to see that in conversations with both Temi and Rucha, both mentioned the joy and importance of wrestling with research questions over dinner with their scientist friends from around the world, away from the lab itself.

# Tested under various conditions

Tonight the dining room is a lab chicken and lamb biryani wafts in from the kitchen board games are spread across the table the laughter is loud, arms gesticulate wildly

A globe comes together Indian, Chinese, Vietnamese, Ghanayan, Nigerian, Pakistani, Spanish exclamations in different languages bounce off the walls

Bodies lean in, voices enquire goodnaturedly why? they ask after each bite, how? what if...? could you...?

Things start to make sense flavoured just right heated perfectly until the answer appears handed to you on a plate

#### INSPIRED BY RUCHA BENARE

As part of my research, I read Rucha's scientific poster about her work in creating chips of living bone cells. The poster itself clearly outlines her research, its challenges, and new developments in her field of study. During our conversation, she often mentioned the pressure and stress of her work, and its impact on her mental health. Using the format of an erasure poem, where words and letters are singled out from an existing text, I created a hidden poem from her poster about perfectionism and the struggle of trying to be an idealised version of yourself.



# In Vitro

#### PROBLEM

there exists a significant demand to make m e relevant

#### **SOLUTION**

attempt to act grown aim to model an ideal

#### IDEAL

A self-constructing perpetually repairing

type

sterilized

creating an idealized

over time

#### CONCLUSION

human no one

b u t the notion

served

holds exciting promise

help

me

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#### INSPIRED BY FEMI BANKOLE

Femi studied physics, and although his career has deviated from physics in an academic sense, he carries much of what he learned during his studies with him through transferrable skills. During the interview, he laughingly said 'I have no love for physics', and through that one sentiment I attempted to outline his career progression and changing feelings about

# I have no love for physics

#### I have no love for physics, for how

the fluorescent lights flickered hour after hour crouched over in labs, I was bored and tired trying to take in information that just wouldn't click the numbers on my leaving cert told me I should be here but I wanted to crawl out of this skin, into another life I persevered until the rift widened then I walked out those doors and did not look back

#### I have no love for physics, for the

hold it has over me, even after years away something about it beckons to me scraping against me like sandpaper I can't seem to help myself, so I return stare out across a lake with classrooms at my back scent of Yorkshire pudding and duck shit across the water I get my Desmond\*, hold it up proud, respectable I proved my point, now I can leave this behind for good

#### I have no love for physics, so

I left it, shut the door on academia on a subject that made me feel smaller and when a woman behind a stand told me there was somewhere I might belong, I listened homesick and ready for change I traded the lake for the Lagan lecture halls for meeting rooms struggle for purpose the subject. It also emerged that Femi and I both studied at the University of York, so I am very familiar with the physics building and the campus, and its large duck population, which I couldn't resist mentioning.

\*In York, a 2:2 was referred to as a 'Desmond'. Similarly a 2:1 was known as an 'Atilla'.

#### I have no love for physics, but

I now see what it has given me what parts of it called out to me the structure of methodology *hypothesis, experiment, analysis, conclusion* now the world is laid out, mapped out in a way that feels so familiar there is no problem I fear now those days are over

I have no love for physics, until

enough time has passed to shake off the weight of expectation and pressure I love that I actually understand *Interstellar* and the mysteries of light, relativity of time the playful madness of the space between things the eureka moments with just pencil and paper revelations echoing through time that still hold true perhaps then

I have a love for physics, because

there's this memory of success, hidden under years of stress a First Year project that excelled above the rest a moment where I saw the way things connect clipping sunlight to electrical currents suddenly there was purpose and triumph a sense of knowing what all this is for

#### INSPIRED BY A TAP SUMMER SCHOOL WORKSHOP

As part of this residency, I wanted to engage with young people and talk to them about science, particularly to demonstrate that someone that excelled at arts and almost failed physics can belong in the STEM space. I contacted the Trinity Access Programme (TAP) that runs a summer programme for students in Dublin from DEIS schools entering their final year of secondary school, and they invited me to give a workshop. We talked about who science is for, and how people who like art and science can share the same spaces. Using a clip from Questlove's documentary *Summer of Soul* where Harlem Cultural Festival attendees are interviewed about the moon landing that occurred during the festival on July 16th 1969, we examined the complexities of scientific discoveries within the context of government priorities and neglected communities.

As part of the workshop, I asked each student to tell me about an aspect of science they thought was interesting, regardless of how well they understood it or whether they studied it. From that I made a list of their responses, which consisted of the area of science and why they thought it was fascinating. The students then were tasked with writing their own poems inspired by this list. To commemorate the experience, for this booklet I have constructed my own poem stitched together from their responses.

Physics	everything stems from it
Engineering	how stuff works
Biology	how living things work
Chemistry	how everything works
Chemicals	create anything
Computer science	endless possibilities
Maths	logic and making sense of things
Paranormal physics	life's mysteries
Technology	breaking limits
Quantum computing	untapped potential for the future
Medicine	medical advancements, curing what could kill you breakthroughs and being helped
Botany	medicinal values of plants
Medical	weird diseases
Computer science	robots
AI	openness and sentience
Astronomy	planets and space
Politics	politics of people and science
Humans	psychology, neuroscience
Biology and philosophy	life and death

# **Everything Stems from It**

how stuff works how living things work how everything works

openness and sentience untapped potential for the future to create anything endless possibilities

to use logic and make sense of things to solve life's mysteries

like

curing what could kill you weird diseases life and death the medicinal values of plants planets and space psychology, neuroscience robots

medical advancements are breaking limits

but amidst the politics of people and science remember that breakthroughs should be about being helped

#### INSPIRED BY LINDA HUGHES

Part of Linda's role at Met Éireann is to communicate the weather to the general public, including working on weather warnings. In this poem, I have taken the weather warning criteria from the Met Éireann website and used it to create a poem about the climate crisis.

#### STATUS YELLOW

Weather that does not pose a threat to the general population but is potentially dangerous on a localised scale. Be aware about meteorological conditions and check if you are exposed to danger by nature of your activity or your specific location. Do not take any avoidable risks

#### **STATUS ORANGE**

Infrequent and dangerous weather conditions which may pose a threat to life and property. Prepare yourself in an appropriate way depending on location and activity. All people and property in the affected areas can be significantly impacted. Check your activity/event and delay or cancel as appropriate.

#### **STATUS RED**

Rare and very dangerous weather conditions from intense meteorological phenomena. Take action to protect yourself and your property. Follow instructions and advice given by the authorities under all circumstances and be prepared for exceptional measures.

# Weather Warning

#### STATUS YELLOW

danger by nature is an avoidable risk

#### STATUS ORANGE

we pose a threat we delay

#### STATUS RED

no action a circus a mess INSPIRED BY DR SIDDHI JOSHI

Siddhi's main area of research is maerl, a coraline (meaning coral-like) algae. This area of research interested her so much that she actually made her own documentary about maerl. Maerl plays an important role in the marine ecosystem, one of those roles being a nursery for fish. The documentary mentions that when a scallop was monitored while entering a maerl bed, its heartbeat slowed down due to it feeling safe within that environment. I wanted to take this image and connect it with Siddhi's love and passion for underwater life that has led to her dedicating her career to ensuring the safety and health of our oceanic ecosystems, especially when many in her line of work end up working for oil companies instead.

# Scallop

It starts with Blue Planet the gentle voice, sweeping shots dart flick and shimmer.

Curiosity becomes intention becomes an ocean crossed, becomes map, becomes sonar and seabed and eager eyes.

An ocean crossed again, back on an island where the lure of drills and rigs and viscous gold make the air thick with unbelonging

This time it doesn't take an ocean but a narrow sea brings me to sediment and maerl, to watery beings, to salt-flecked kin.

Off a Galway shore, amongst red algae, and the shimmerlilac of a coraline maze, a heartbeat calms and slows, safe at last.

### INSPIRED BY

Linda's work at Met Éireann involves forecasts for the public as well as marine and shipping, and earlier in her career, aviation as well. She explained how although they can try their best to predict the weather, there is always a limit. With forecasting relying on calculations based on the atmosphere, which itself is a broad and shifting thing to work with, accuracy can only go so far.

## Forecast

pressing equations up against a heavy sky molecules slipping through fingertips through structures and predictions and tv screens seeing only the bulk of them, taking what can be used moulding them neatly into packaged warnings neatly-named storms, sunny skies with sunny smiles

on another screen, away from public eyes small dots move across wide waters the push of them into known routes into tried and tested spaces precious cargo, pulled from below the surface to skim across the water, from coast to coast

until a singular ship or a rogue molecule slips under the radar, unseen ripples echoing out from itself I was invited to the IOP Spring Meeting in Armagh in March 2023. While there, I met the IOP International Relations Manager Elora McFall, who recommended a book to me that was published only weeks before our event. It was *Collision: Stories from the Science of CERN*, an anthology of short fiction written by award-winnning authors (including our own Lucy Caldwell!) paired with CERN physicists to explore some of the discoveries being made. Reading the short stories, and the accompanying afterwords by CERN scientists, I was inspired to write a piece about symmetry in particle physics and connect it with an art piece I saw many years ago. I am especially attracted to writings on particle physics as I feel it resonates with the complexity, duality, and contradictory nature of the human experience, and how it works particularly well in conversation with multidisciplinary art practices.

"The presence of symmetry can allow an object after a transformation to be identified as the same one as before the transformation"

Dr Carol Weydert, Collision: Stories from the Science of CERN

TAKEN FROM HERE TO WHERE IT CAME FROM AND TAKEN TO A PLACE AND USED IN SUCH A MANNER THAT IT CAN ONLY REMAIN AS A REPRESENTATION OF WHAT IT WAS WHERE IT CAME FROM

TAKEN FROM HERE TO WHERE IT CAME FROM AND TAKEN TO A PLACE AND USED IN SUCH A MANNER THAT IT CAN ONLY REMAIN AS A REPRESENTATION OF WHAT IT WAS WHERE IT CAME FROM

1980 Lawrence Weiner American, 1942–2021

# Symmetry

Let's say we split this one down the middle.

Let's take that first statement. that rising resonance that bubbles up, shoots up the sinuses, that familiar pain before the tears start, the way they do during a movie when something plucks at the insides of you from all the way across a room. Or maybe it's just hormones? We take that feeling of hope, of solidity, the comfort that if in particle physics a thing knows how to get back to itself after all it's gone though, maybe the same can be said of you? But then, the difference is in observation, maybe. That the object, in physics, can been identified, meaning, someone is looking at it, watching, observing, naming.

Which we suppose is Mum, really. The person who does in fact, see the you that emerged from her sliced open belly, as the same you standing taller than her now. She probably knew about the mole behind your ear all along, the one you only just found after shearing you hair short. She didn't like it, said it reminded her of your father. Maybe that's what the observer feels, that first sentence, it's about the person doing the identifying really more than the object itself. The object itself, you, how do you feel?

Well that's when the second statement comes in. Up on a wall at the Art Institute of Chicago an art piece by Laurence Weiner, created eight years before you were sliced out of a belly. The words that you felt have been carved into your bones from the day you first moved from Point A to Point B and never truly back again. And there was no hope in that artwork, in the livid green of its brazenness, only a nod to the shadow in you, the choke of knowing you are no longer the object, but only a representation of it. You have always felt like shadow, like echo, like imprint. Like something only existing because of everything that's been thrown at you. Let it bounce off, let it make your lack of presence known.

Weiner felt the permanence and integrity of a linguistic construction, presented as a title in the form of a simple descriptive phrase on the wall, was less vulnerable to change over time than an actual sculpture. This work—which describes a physical act of displacement as a metaphor for representation—and its title are one and the same'.<sup>1</sup>

What a grand denial of the erosion of time, of weak force. Even if the vinyl peels and chips and curls in on itself at the edges, it'll still be reinforced by the capital letters hollering out from the caption next to it, from the page in the catalogue, from internet searches, from Art History lectures. I AM NOT THE STATUE screams Weiner into the void, joyfully, lovingly, desperately, as the armless torso of Venus de Milo looks on, flexing her abs until they crumble to dust.

So let's split this down the middle. Which feels right because that's how you feel all the time. Split down the middle, mirror yous, fleshy and sliced but somehow still moving, like a severed worm.

Let's split this down the middle and say you are both all at once, when unobserved, because that's how particles do it so why can't you? Let's say when nobody is looking, when Mum isn't calling, when you're at home rattling in the loneliness of yourself, you are both the same thing you have always been and also the echo of what you were, those things happening out into the universe and resonating back and forth, until they are perfectly layered. Maybe you are same, and also echo. Maybe you are anchored and also afloat. Maybe you just grew into your ears.

Until someone observes, and we split once again, to be one or the other. But as soon as their head is turned ....

#### INSPIRED BY RUCHA BENARE

When Rucha was explaining her work to me, I noticed she kept using baking references when describing the process of creating the osteochips. She described the 3D printed scaffolding as a sort of muffin tray, and the pancake reference came directly from the interview. She also spoke of the challenges of academia and the sexism and general bad behaviour that often occurs due to the competitive nature of the field, especially when the research teams lack diversity. And when I combined competitive environments with baking metaphors, the natural outcome was this poem!

# The Great Bone Mesh Bake-Off

Paul Hollywood has his arms crossed, steely eyes glinting mischievously. 'I want you to grow a mesh of bone cells'. Bakers turn to each other, flabbergasted (one smiles serenely, she has practiced this one at home). 'You won't be getting a recipe', he says. The bakers gasp, even the confident one appears rattled. Noel Fielding says 'bone appetite!' and giggles awkwardly to himself as the bakers run to their stations, stare helplessly at the equipment around them: a 3D printer, petri dishes, stem cells, collagen coatings, microscope.

'What are they even supposed to look like?' says one flustered baker to camera. The voiceover informs us that as they were quite recently invented, nobody really knows what the perfect one looks like yet.

The camera pans to Alison Hammond on the other side of the tent. She asks Prue Leith 'what are we looking for here?' Prue glances over her glasses and speaks under her breath: 'The bakers need to create a coated polymer chip seeded with living cells, an osteochip'. Alison leans in comically, speaking out the side of her mouth

<sup>1</sup>Art Institute Chicago website www.artic.edu

'And what on earth does that involve?'

'Well,' begins Prue, calmly,

'They need to 3D print a structure that is first sterilized, then coated with collagen and nano-needle Hydroxyapatite (nnHA) coating, and analysed for the chip shrinkage over time. The construct should then be seeded with murine osteocyte-like cell line called MLO-Y4 and stained using DAP/Actin to observe the development of osteocytes.' '…right', says Alison.

Paul Hollywood has joined them, and leans in.

'Basically a lab-grown chip of living bone that can be used to test drugs for diseases like osteoporosis and eventually replace animal testing'

'Oh OK I get it!' says Alison, before shooting the camera an exaggerated glance that says, 'I still don't understand', even though she has a PhD in biomedical engineering.

After some time the bakers have finally figured out that they need channels between the wells of batter. They are rushing between benches, muttering to themselves. One baker is on his knees, groaning in dismay as his batter overflows and forms a single blob. 'It's like a bloody pancake!' he cries, holding back tears. 'I'll have to start all over again.' His neighbours pat him on the back, encourage him (but not too much, they don't want him to win)

The camera pans to one baker, hat askew, who is watching the disaster closely. She begins chattering excitedly to camera 'I think the wells need to be hydrophilic... and the channels and some of the chip surface hydrophobic, I think that will help them stay in shape!' Some bakers are looking at her suspiciously now. The camera pans to one baker who grins and winks at the camera, 'every man for himself, I'm in it to win it!' he says, confidently copying her method.

After a gruelling afternoon in the tent it's judging time, every baker presents their work. Paul casts his eyes over the samples, taps them, inspects closely, Prue picks them apart one by one, they place placards in order from worst to best. 'Our star baker this week is...' she points at the young enthusiastic baker, her hat still askew. She is hugged by the women around her, despite their clear disappointment. The men in the room clap politely, one rolls his eyes. Now the hard part.

Bakers are tearing up, holding each other tight, white-knuckled, despite most of them violently disliking each other. There is a plot twist! 'This week', says Paul, 'despite a LOT of soggy bottoms...' the bakers are practically vibrating with tension. '...nobody will be eliminated'. Our bakers double over in relief, hugs are shared and tears flow.

Outside they're interviewed one by one. 'I was so close!' one exclaims. 'I have no idea what I'm doing' says another. They pack their bags and head offsite, exhausted, steeling themselves for the next challenge. Just another week in the Bake Off tent. INSPIRED BY RUCHA BENARE

As part of my research into Rucha's subject, she sent me a scientific poster about Biohybrid Robotics. I intended to create a poem about the subject itself, but some of the sentences and descriptions jumped out at me in a different way. As an autistic person, there is a cliché that we are unfeeling, rigid, and 'robotlike' which is harmful and often incorrect. However for me this is a complicated idea, as despite feeling, if anything, far too many emotions, I actually find comfort in identifying emotions and ways of being through the language of computer programming and robotics. On these pages are two poems where I have resonated with the robots used by researchers.

In this particular poem, I wanted to create a resonance between biohybrid robots (robots grown from muscle cells that only require chemical energy to function) and my experience of autism, focusing on feelings of justice, connecting with nature, autonomy and ability to adapt, and our important role in society.

# Biohybrid <del>Robotics</del> Autistics

Small soft

pro grammed for diff er ent mo tion abil it ies

ad apt to in ter ac tions with nat ural en vir on ments and hu mans.

autonom ous and ad apt ive

As seen with the eyes of an en gin eer

hold prom ise for fu ture

they have in trinsic soft ness, higher en vir on mental safety and com pat ib il ity

than tra di tional ro bots

INSPIRED BY DR SIDDHI JOSHI

While talking to Siddhi about her experiences on ships in her role as biogeoscientist and oceanographer, she talked about the use of Remote Operated Vehicles (ROVs) and how they are used for gathering information, in this case in water up to 600 meters deep.

# Release

the deck is noise-filled, babble bustle and buttons bated breaths and strained muscles sea spray and grey clouds fizz and glimmer

I crave release, can feel the cold reaching up from the surface a universe of secrets waiting impatient, heavy, swaying, I am ready to feel weightless

finally, the lowering, the sigh of it ice cold with the comfort of a hot bath salt and flicker, rumble and pressure

the muffled silence of ocean, bubble and echo no more small voices, shrill, sharp laughter only power, only the big, the wide, the open

> I wonder if I could will it to happen the cable, umbilical, designed to keep me unbirthed, tethered, tame and trained

*imagine a snap, a wrench, a plummet the weight of myself sinking settling into sediment, into detritus, into seabed* 

birthed into the birthplace, from mother to mother an inconceivable peace, unfathomable I will not miss fluorescent lighting

I wasn't ready to return to the surface to be dried out, analysed, put to use again I have no voice to scream in their faces, *put me back* 

> but I never really left, a part of me remains while androids dream of electric sheep ROVs dream of the sweet dark deep

#### INSPIRED BY TEMILADE ADEGOKE

It became clear to me very early on in my conversation with Temi that this was going to be a love poem. The way she spoke of the enormous electron microscope was filled with a determined, dedicated passion. Temi's research utilises imaging techniques to examine in real-time the responses of materials, particularly nanomaterials, to various environmental conditions as they would experience when in use. Using in-situ electron microscopy, her research aims to understand the structure and dynamics of materials, optimise processes, and evaluate their performance in technological applications. The Transmission Electron Microscope (TEM, coincidentally) that Temi uses at the University of Limerick is an extremely valuable piece of equipment, and its acquisition was mentioned in several news reports, accompanied by a press photo of a Lego version of it. In addition to her work, Temi mentioned that she was recently diagnosed with fibromyalgia, and talked about the difficulties of working when affected by symptoms of the illness but still able to push through. In this poem I aimed to bring all these different elements together.



To-scale Lego model of the FEI Titan Themis Transmission Electron Microscope created to launch the microscope at the University of Limerick.

### The girl and is the tower

the girl is the tower is the little lego man is the girl staring at the screen, legs tired, boots chafing until the images of nanowires are burnt into her eyeballs stamped onto her corneas her favourite film projected onto the back of her skull on repeat

at home in bed when she closes her eyes the flaky tendrils and blurry grids pulse with promise and power and when she has nightmares they are of dendrites and exploding batteries and cars on fire and the pain of dragging the carcass of hope back to square one, the smell of burning is still in her hair when she wakes

but when she dreams now on the occasional night of solid sleep *soft smile, warm pillow, furrowed brow* she dreams of the perfect day when the sample prep is successful and her eyes light up, everything aligns just right

*let's not think of replicating this perfection not right now, let her enjoy the moment* when it's just her and the screen the girl and the microscope the size of a room

they are in love don't you see you can't take her off the board you can't treat her like the little lego man unclick her aching body racked with pain you know nothing of wrung with fatigue you know nothing of

they are Gemini souls woman and microscope let them blaze quietly in the white room together **Chandrika Narayanan-Mohan** is a Dublinbased writer and performer from India. Her work has been published by Dedalus Press, Lifeboat Press, Poetry Ireland, *Banshee*, and *Stinging Fly* amongst others. Chandrika was selected to participate in the Irish Writers Centre's XBorders programme 2018 and 2020, Poetry Ireland's Introductions 2021, and Science Gallery Dublin's Rapid Residency 2021. Chandrika was editor of Poetry Ireland's *Trumpet* issue 9, is book reviewer for Children's Books Ireland's *Inis* magazine, and is on the Board of the Irish Writers Centre. She is Writer in Residence for the Institute of Physics for 2023.



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