



Innovation for solving wicked problems



Open Doors Event, 15th Feb 2023
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The CREW at IdeaSquare



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Communications



Laura Wirtavuori
Edu programmes



Ole Werner
Edu Programmes



Dina Zimmermann
Prototyping



Markus Nordberg
Fixing things



Pablo Garcia Tello
The bear from Mowgli



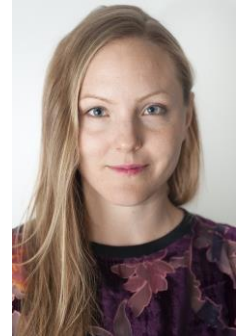
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Catarina Batista
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Jimmy Poulaillon
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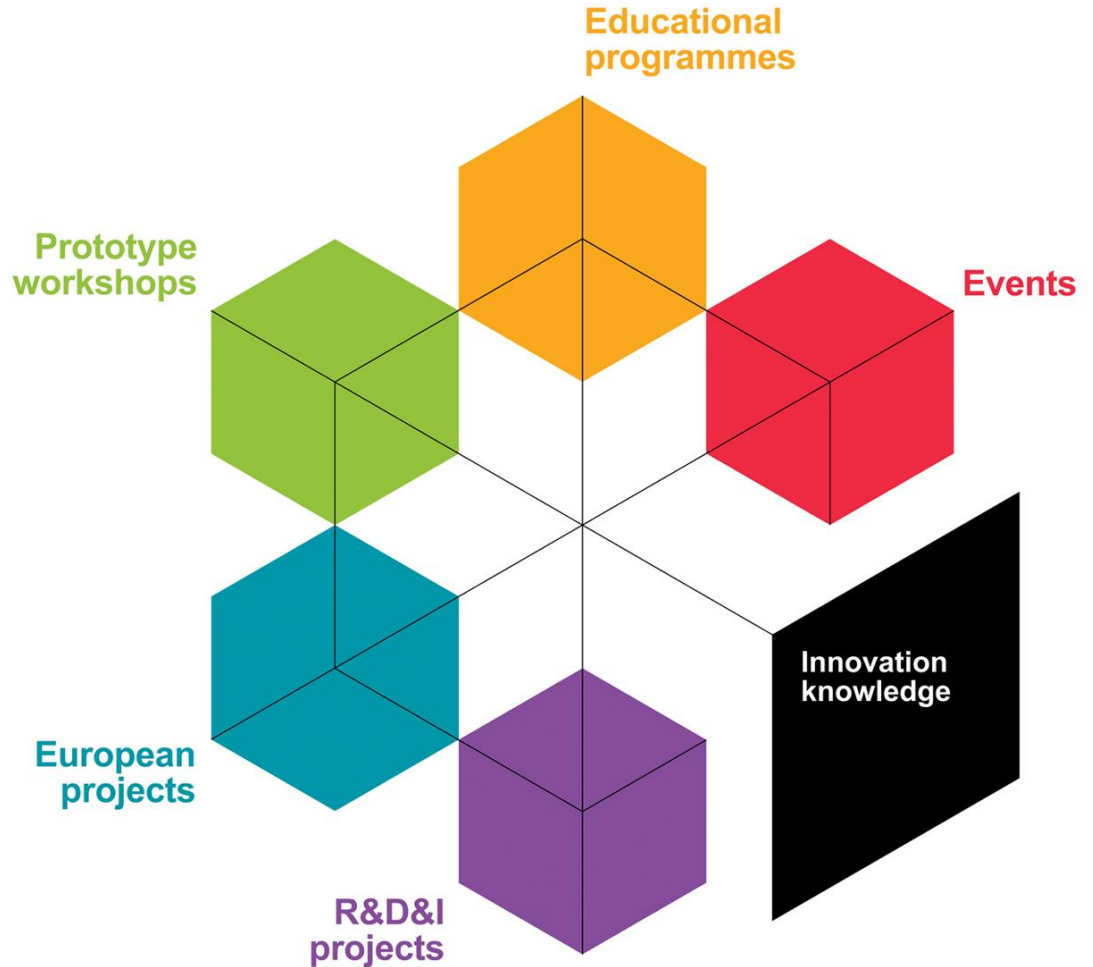
Tuuli Utriainen
Cosmic collaborator

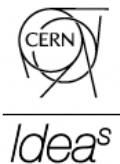
IdeaSquare

The Innovation Space at CERN

- collaborative methodologies;
- access to CERN expertise;
- cross-connectivity

to ideate solutions for the
future of humankind.





**A place where
people have the
licence to dream!**





Solving wicked problems in times of change

Some examples of complex problems



- Climate change
- Homelessness
- Integrated healthcare
- Smart cities
- Poverty
- Gender equality
- ...



SDG Game!



Once a hydropower dam has been built, its impact on the environment is neutral.

A True

B False





Once a hydropower dam has been built, its impact on the environment is neutral.

A True

B False



B - False

While hydropower is considered renewable energy, dams can have large environmental consequences. The decay of submerged vegetation produces methane, which is one of the most detrimental greenhouse gases. In addition, dams can cause significant damage to river ecosystems. When planned and operated poorly, they can cause the collapse of entire fish stocks, resulting in increased poverty, malnutrition and migration in downstream populations dependent on fish for food and livelihoods.





Poor families, when given cash, are more likely to spend it on...

A education.

B alcohol.





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A - education.

Generally, when given cash, poor people tend to spend most of the money to cover their basic needs. In Brazil, for example, in one of the biggest cash transfer programmes in the world, researchers found that poor families invested more in education than in alcohol and other consumables when given extra cash. In a separate global study, it was found that cash transfers resulted in increased school attendance due to the removal of financial barriers. Cash transfers, rather than distributions in kind, are being increasingly used as an effective way of helping the poor.





There are more refugees
living in...

A

high-income countries
(Gross National Income
(GNI) per capita of over USD
12,235 per year).

B

low-income countries (GNI
per capita less than USD
1,045 per year).





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B - low-income countries
(GNI per capita less than USD
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In 2017, 5.3 million refugees lived in the 34 low-income countries of the world, whereas 2.9 million lived in the 78 high-income countries. Germany is the only high-income country in the top-ten host countries for refugees (1 million); low-income countries bear a disproportionate burden in hosting refugees, including Uganda (1.4 million) and Ethiopia (0.9 million).





What is the percentage of the global population that does not have access to education in a language they speak or understand?

A 5%

B 40%





What is the percentage of the global population that does not have access to education in a language they speak or understand?

A 5%

B 40%



B - 40%

It is estimated that 40% of the global population does not have access to education in a language they speak or understand. Bilingual education is important especially in ethnically diverse countries and has proven to improve learning and school attendance.





Lesbian, Gay, Bisexual,
Transgender and Intersex
(LGBTI) people in China are
more accepted in their...

A Families.

B Workplaces.





Lesbian, Gay, Bisexual,
Transgender and Intersex
(LGBTI) people in China are
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A Families.

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B - Workplaces.

According to a National Survey conducted by UNDP China, Peking University and Beijing LGBT Center on social attitudes towards sexual orientation, gender identity and gender expression, families have the lowest degree of acceptance for LGBTI groups (8.1%). In contrast, less than 30% chose "complete rejection" by their school teachers, supervisors and colleagues for identifying as LGBTI.





Xiaoli wishes to reduce her personal water footprint. Which strategy would be more successful?

- A To eat pork one time less per week
- B To shower one time less per week





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A - To eat pork one time less per week

In China the average person consumes 2,934 litres of water per day, of which only a small proportion is for household needs. The lion's share goes towards food and other consumer products. Pork meat (200g) requires around 1197 litres of virtual water (water used in the production of food and other consumer products) to produce. For household needs – including showering – the average Chinese person uses 28 litres a day.





Between 2010 and 2015,
forest cover in China has...

A increased.

B decreased.





Between 2010 and 2015,
forest cover in China has...



A - increased.

A increased.

B decreased.

Over the last three decades, forest cover in China has continued to increase, with 338'000 square kilometers of new forest having been created just in the past five years. In order to reach the ambitious target of 23% land covered by woodlands by 2020 (from 21.7% in 2016), 60'000 soldiers and armed police officers have been assigned to plant trees. The efforts towards afforestation are aimed to tackle high levels of air pollution and to sequester CO2 emissions.





If current trends continue,
by 2050, there will be, by
weight, more of which of
these two in the oceans?

A Fish

B Plastic





If current trends continue, by 2050, there will be, by weight, more of which of these two in the oceans?

A Fish

B Plastic



B - Plastic

If current trends continue, by 2025, there will be about one tonne of plastic for every three tonnes of fish in the ocean, and by 2050, there will be, by weight, more plastic than fish in the ocean.



There are more countries
worldwide...

A with freedom of
expression and
freedom of the press.

B without freedom of
expression or freedom
of the press.





There are more countries worldwide...

A with freedom of expression and freedom of the press.

B without freedom of expression or freedom of the press.



B - without freedom of expression or freedom of the press.

Across the world, freedom of the press is increasingly under pressure. In the majority of countries, the media is controlled and media professionals are impeded in their work, whether through censorship, control, or violence. Truly free media is an exception worldwide. According to the 2019 World Press Freedom Index by Reporters without Borders, the top ten positions are held by Norway, Finland, Sweden, Netherlands, Denmark, Switzerland, New Zealand, Jamaica, Belgium and Costa Rica.





In the world, on average,
it is more likely to...

A be forced into slavery.

B die because of homicide.





In the world, on average,
it is more likely to...

A be forced into slavery.

B die because of homicide.



A - be forced into slavery.

In 2012, intentional homicide took the lives of almost half a million people. 40 times more (21 million) were victims of forced labour. Forced labour denotes situations in which the persons involved are made to work against their free will, coerced by their recruiter or employer, or by more subtle means such as accumulated debt, retention of identity papers or threats of denunciation to immigration authorities.





Worldwide, there are more people who are...

A overweight.

B undernourished.





Worldwide, there are more people who are...

A overweight.



B undernourished.



A - overweight.

Worldwide, there are approximately 821 million people suffering from undernourishment. While hunger has decreased over the last several decades, the number of overweight people has constantly increased to reach 2.2 billion people in 2016, according to the World Health Organization.





**A system is an ever living
organism...
So how might we predict
possible changes?**



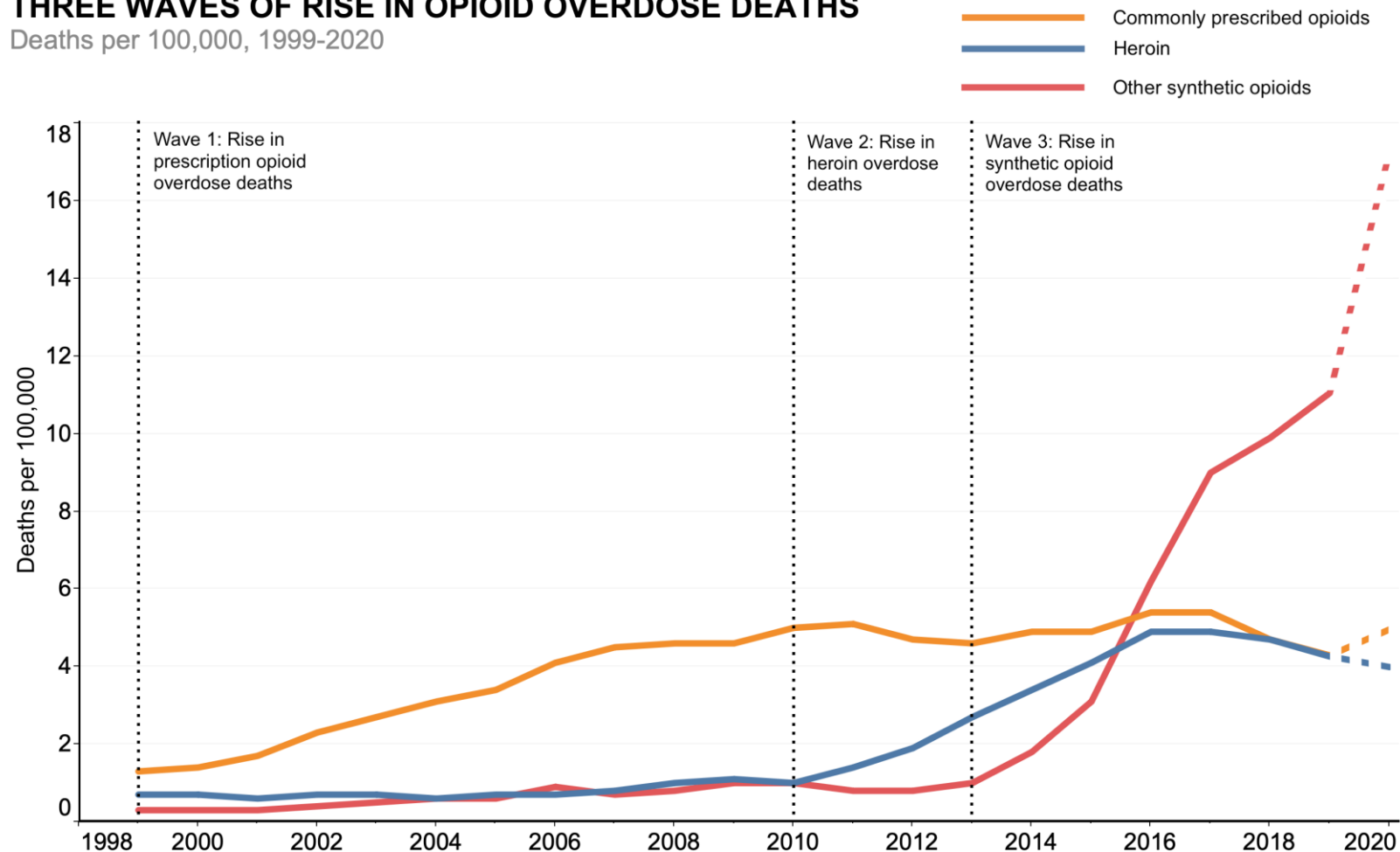
Prediction is very difficult, especially
if it's about the future.

— *Niels Bohr* —

AZ QUOTES

THREE WAVES OF RISE IN OPIOID OVERDOSE DEATHS

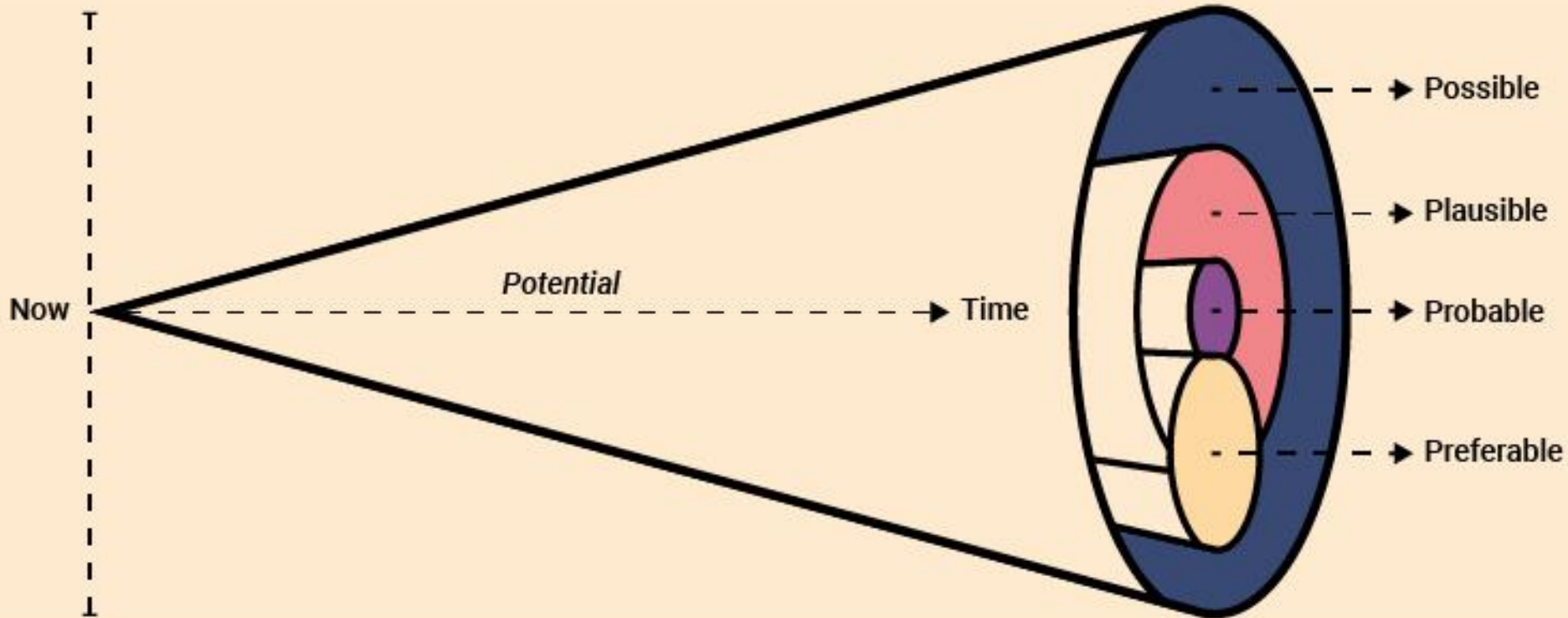
Deaths per 100,000, 1999-2020



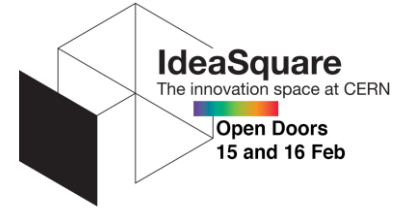
Note: Dotted portion of each line represents preliminary data from the CDC

Source: National Vital Statistics, Mortality File

There are many possible futures...



Imagine the future

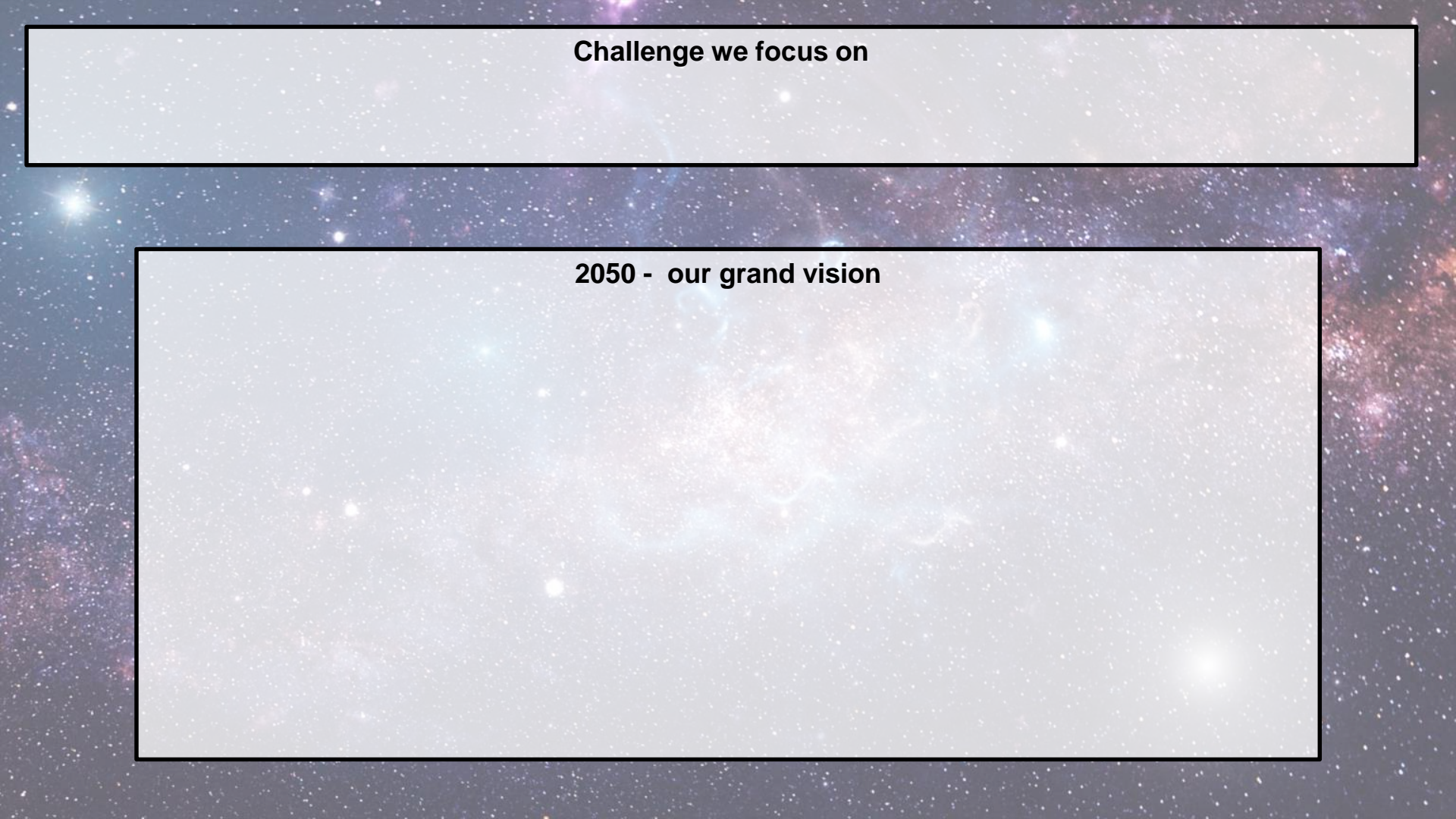


- Choose **one challenge related to the SDGs** to work on, e.g:
 - access to clean water / free access to clean drinking water for all
 - no poverty / no homelessness
 - access to quality education / everybody gets basic education in their own language
- **Imagine** what the world will look like in 2050, when that challenge has been solved. Consider **technological, social, economical, legal, ethical, political and environmental aspects.**

No Harry Potter, but reasonable assumption about tech advancement, for e.g., are ok.

Note that you can modify the challenge as you go along.

(15 min)



Challenge we focus on

2050 - our grand vision

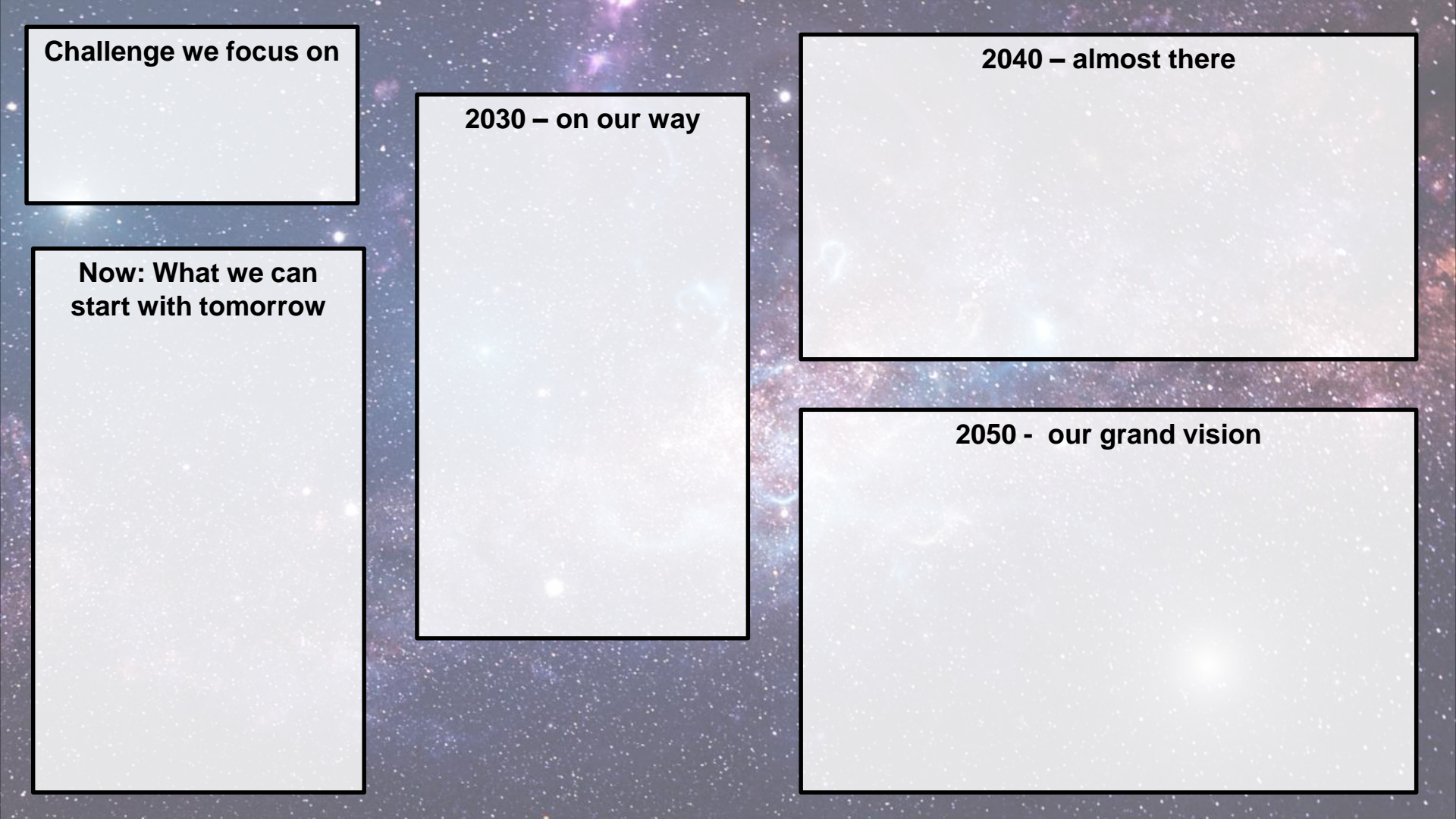


Let's reflect...



How does your preferable future look like?

- Where **you would need to be in 2040**, in order **to achieve your vision** for 2050?
How about in **2030**?
- What can you **change today** to make your 2050 vision **more probable**?
- How does that **impact** your journey as **an individual and professional**?



Challenge we focus on

**Now: What we can
start with tomorrow**

2030 – on our way

2040 – almost there

2050 - our grand vision



How to fill the canvas



1. **Write your challenge as clearly as you can** – it has to match the vision you came up with and does not need to be exactly what you started with.
2. **Write your key insights for your vision:** include technological, social, economical, legal, ethical, political, and environmental aspects.
3. Think **about where we would need to be in 2040**, in order to achieve your vision for 2050.
4. **Think backwards** and outline what that would mean for the **year 2030**.
5. What should we start **implementing now** in order to get to your 2050 vision?

(30 min)



Time to share!

Educational programmes





Why IdeaSquare?

We believe that for **fundamental change** to be made,
we need **more than traditional** innovation **methods**
and mindsets.



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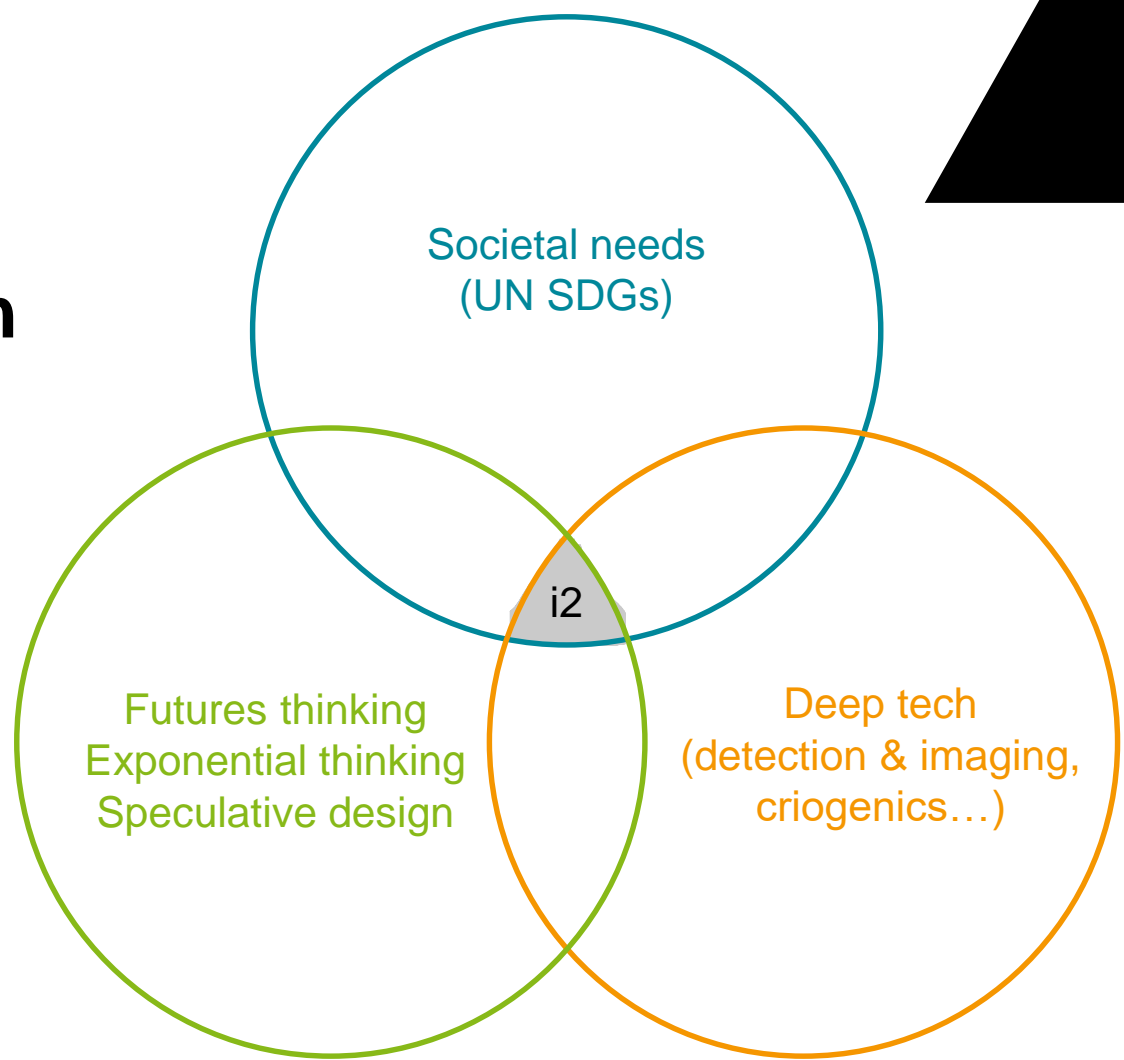
We enable students and innovators to **imagine a**
future worth fighting for, and we give them the **tools**
and confidence to start building that future.

Challenge Based Innovation (CBI)



- **+22** active program collaborations;
- Universities from **8 different countries**;
- **Design Thinking** methods to solve global challenges, intersected with **deep tech**;
- **UN Sustainable Development Goals** as a lens in the process;
- **Multidisciplinary teams** of students: business, design, engineering, social sciences...
- CERN researchers who act as technological coaches.

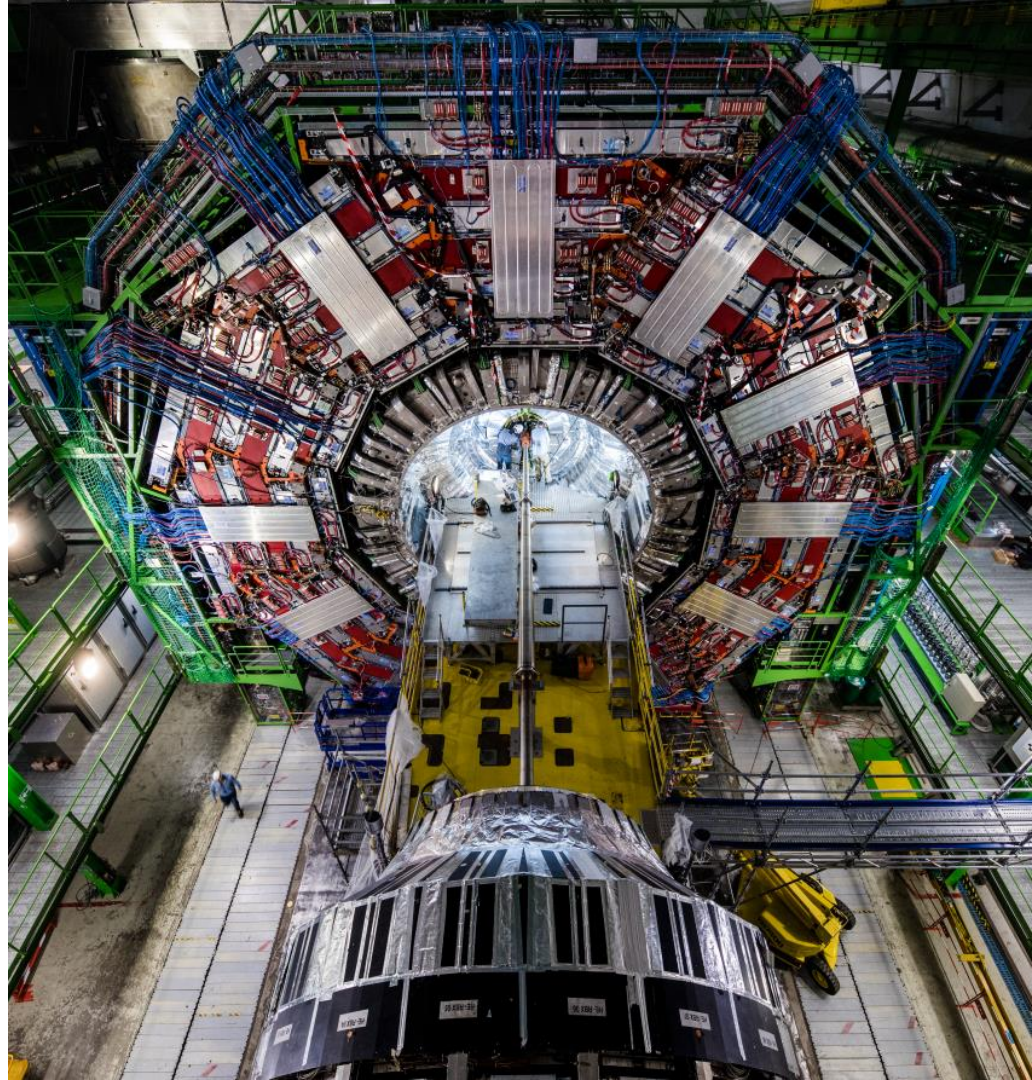
Intersecting societal challenges with deep tech



**Business as usual
is not in our DNA,
but we also don't
want any “magic”...**

Ideas should be disruptive, without:

- Breaking the laws of physics;
- Causing more harm than good.





Our specialties



- **Order of magnitude thinking (+ estimations!)**
 - Ideas should be disruptive enough to generate excitement
 - While also having a substantial basis behind - “Do the math”
- **Systemic and Exponential thinking**
 - Going for exponential ideas
 - Thinking in planetary levels
 - Nothing is so great that there is nothing bad: what are the implications of your solution?



How can you get involved... and why?

Listening to the stories of Shalini Epari and Gunn Khatri.



How can you get involved?

- Send us an email to idea.s@cern.ch (it will come to one of us).
- Let us know what you are interested in:
 - interacting with the students;
 - attending their presentations;
 - providing your expertise (software engineering, CERN tech...)
 - tours of CERN experiments
- We will keep you informed about future opportunities!



Contact us!
#CERNIdeaSquare
ideasquare.cern

|
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Further reading and sources

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