Breaking disciplinary boundaries:

Embracing collaboration, multidisciplinarity, and transdisciplinary research

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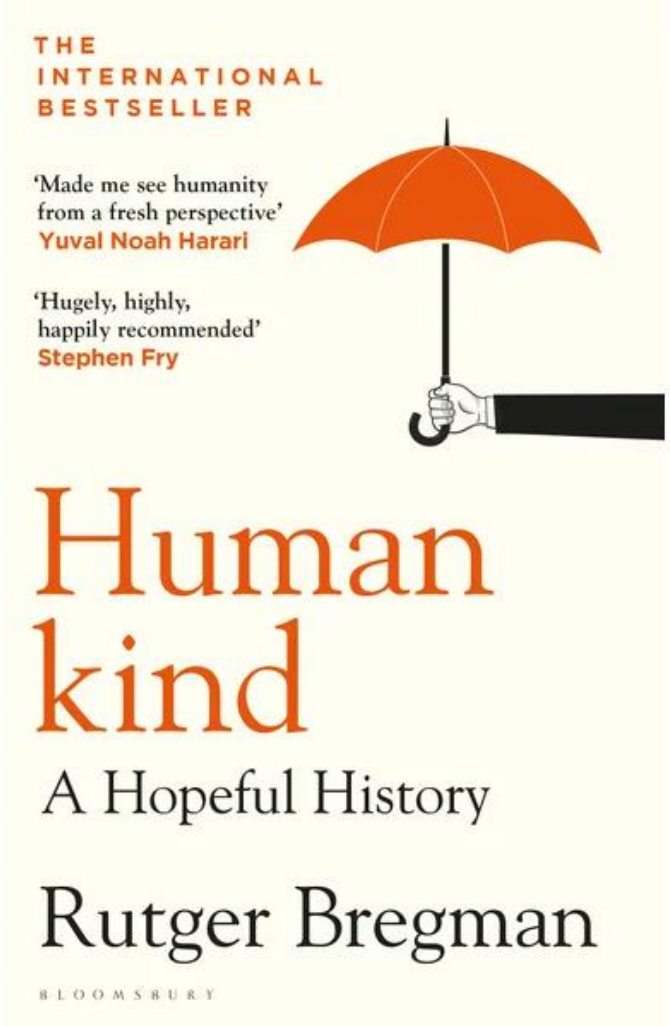
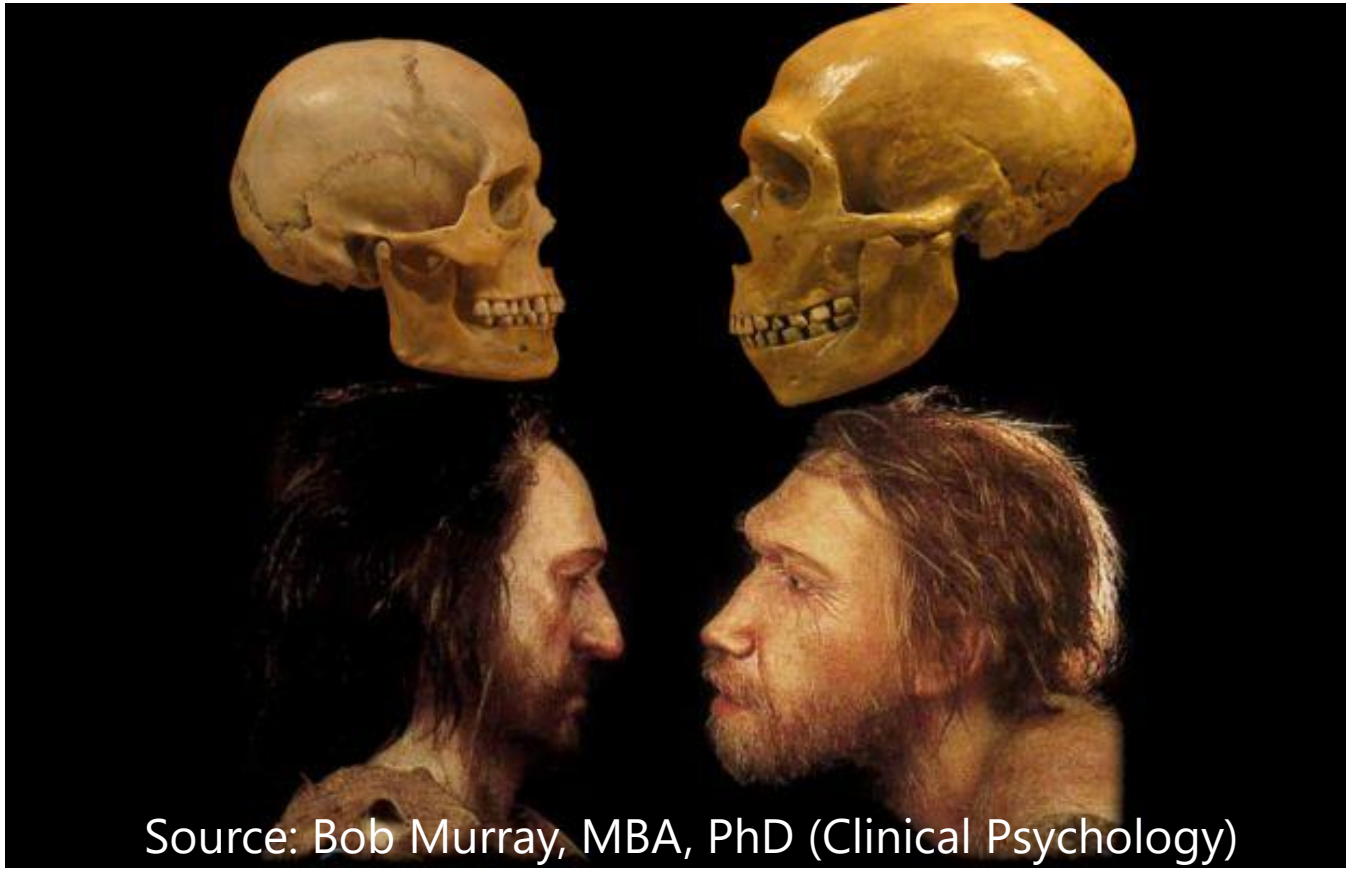
Belgian Nuclear Research Centre

Introductory meeting of doctoral students, Faculty of social sciences, FDV
University Ljubljana, Slovenia: 24. of October, 2024

Capacity: Homo sapiens vs. Neanderthals
Capacity: Collective vs. Individual

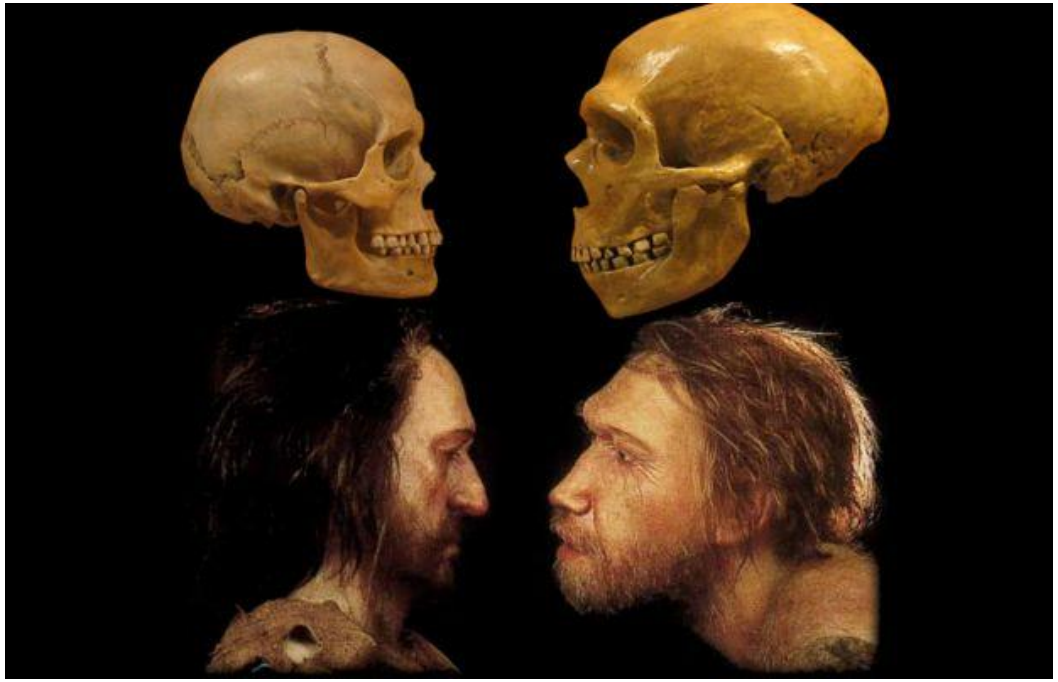



Source: Bob Murray, MBA, PhD (Clinical Psychology)

Homo Sapiens: Ability to collaborate, share knowledge, and work together in large groups, demonstrating the power of collective genius, thrived through social cooperation and shared creativity.

Neanderthals: Physically stronger and had larger brains, relied more on individual skills

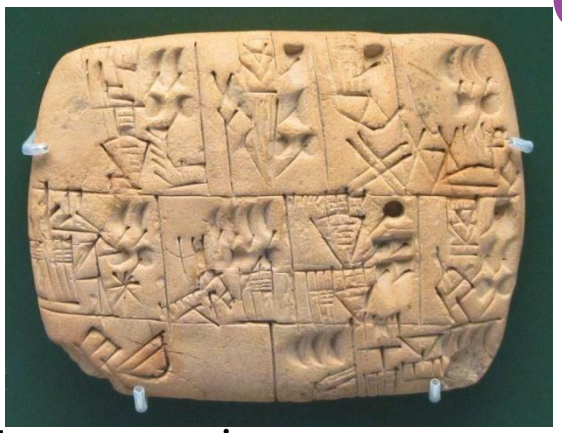
Capacity: Homo sapiens vs. Neanderthals
Capacity: Collective vs. Individual



Stone tools, Spears, Fire control, Clothing, Shelter…

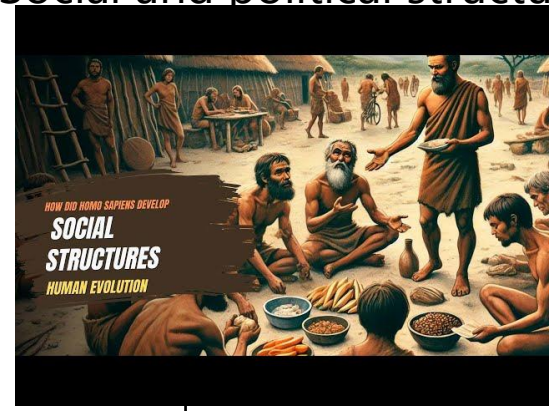
Capacity: Homo sapiens vs. Neanderthals
Capacity: Collective vs. Individual

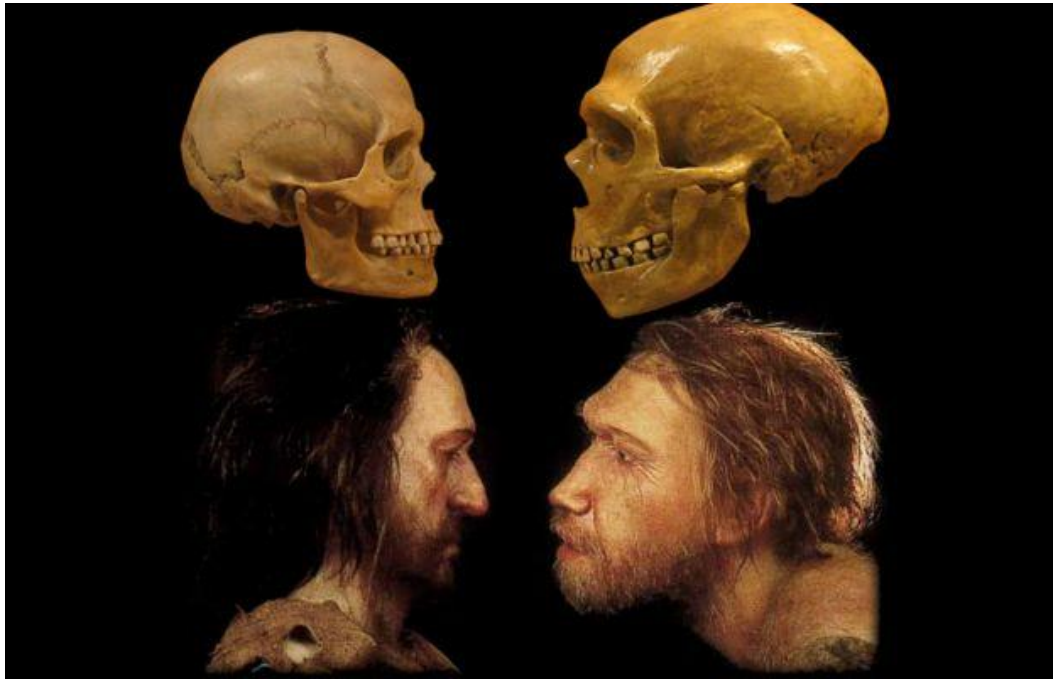
Writing & record keeping



Transportation

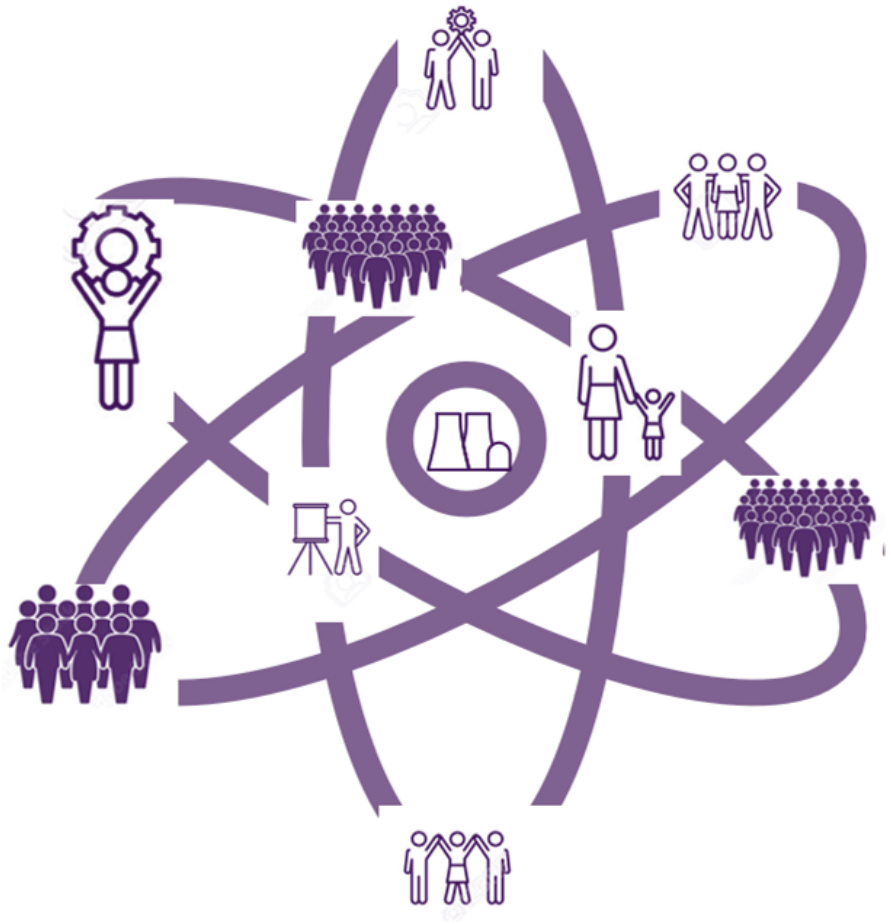
Social and political structure





Stone tools, Spears, Fire control, Clothing, Shelter…

Collective genius



I firmly believe that **the most powerful breakthroughs come** not from individual efforts but **from the collective genius of diverse minds working together**.

Breaking disciplinary boundaries is not just a necessity in today's complex world—it is an opportunity to harness the richness of collaboration, multidisciplinarity, and transdisciplinary research. By embracing these approaches, we **open doors to new insights, innovative solutions, and transformative progress.**

What is my expertise?

Phd in Sociology, University Antwerp, Belgium

"Risk communication and risk perception in nuclear emergency management: A multidisciplinary approach"

MSc in **Defense studies** & bachelor in **Journalism,** FDV, University Ljubljana, Slovenia

Tanja Perko

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TITLE	CITED BY	YEAR
Radiation risk perception: a discrepancy between the experts and the general population T Perko Journal of environmental radioactivity 133, 86-91	149	2014
Importance of risk communication during and after a nuclear accident T Perko Integrated environmental assessment and management 7 (3), 388-392	79	2011
Information sources as explanatory variables for the Belgian health-related risk perception of the Fukushima nuclear accident B Vyncke, T Perko, B Van Gorp Risk Analysis 37 (3), 570-582	63	2017
Communication in nuclear emergency preparedness: a closer look at information reception T Perko, B van Gorp, C Turcanu, P Thijssen, B Carle Risk Analysis 33 (11), 1987-2001	63	2013
Is knowledge important? Empirical research on nuclear risk communication in two countries T Perko, N Železnik, C Turcanu, P Thijssen Health Physics 102 (6), 614-625	48	2012
Public opinion change after the Fukushima nuclear accident: the role of national context revisited E Latré, T Perko, P Thijssen Energy Policy 104, 124-133	43	2017
Media reporting of nuclear emergencies: the effects of transparent communication in a minor nuclear event T Perko, C Turcanu, B Carlé	40	2012

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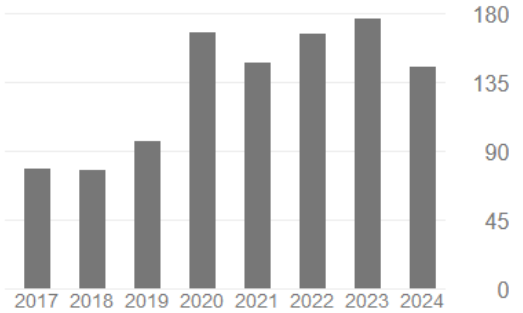

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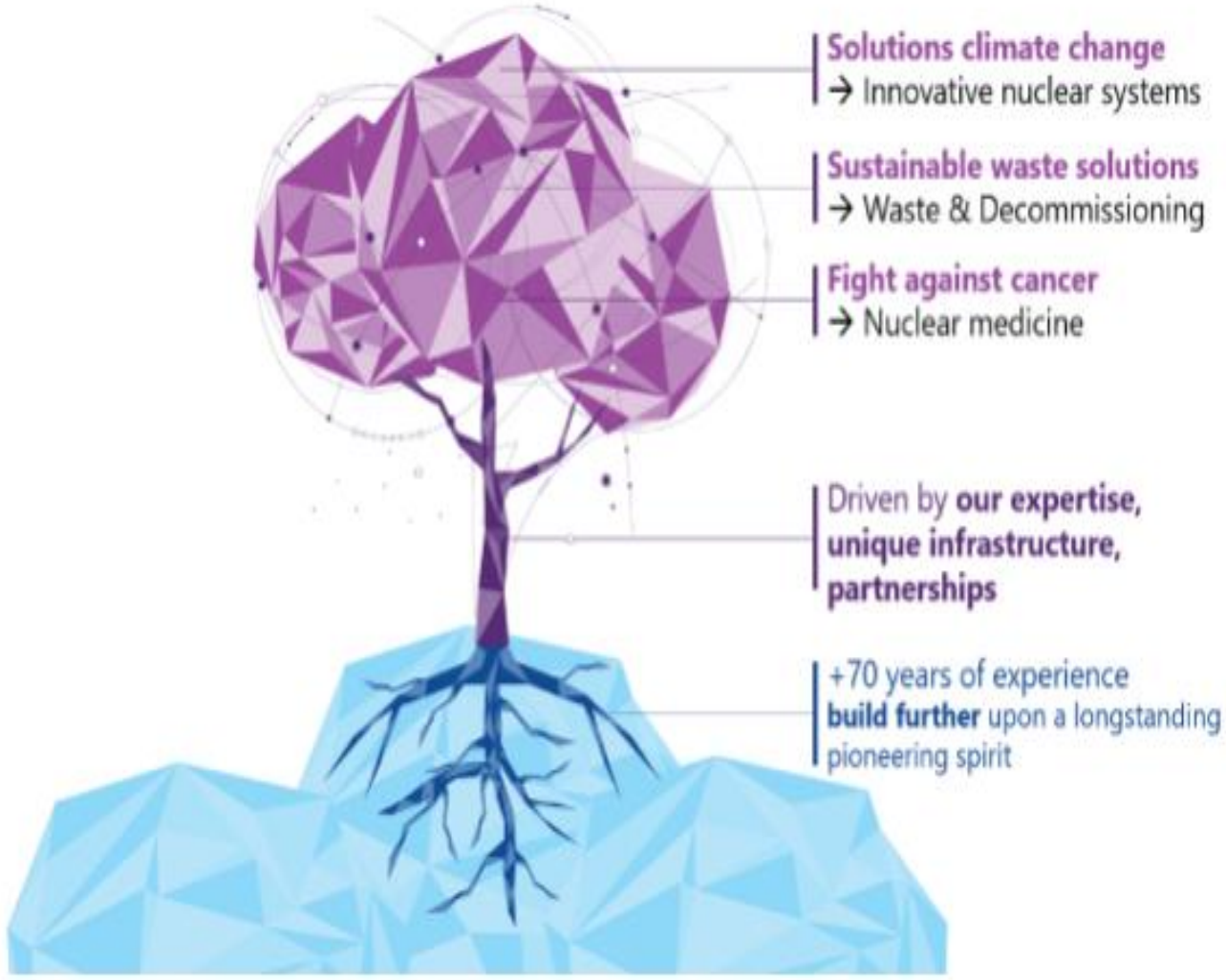

What is here for YOU?

Upon completing your PhD in SSH, you will possess a strong theoretical foundation, methodological expertise, analytical skills, and reflexivity, enabling you to contribute effectively to addressing complex "How to" questions.

You will be equipped to become a valuable member of interdisciplinary teams, contributing unique perspectives.

How collaboration across disciplines shaped my most impactful work

Acknowledgements

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Knowing the unknowns: Uncertainties during radiological emergencies

Ferdiana Hoti [a b], Tanja Perko [a b], Vasiliki Tafili [c], Roser Sala [d], Nadja Zeleznik [e], Yevgeniya Tomkiv [f], Catrinel Turcanu [a], Peter Thijssen [b], Ortwin Renn [g]

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Received 8 February 2021, Revised 28 March 2021, Accepted 30 March 2021, Available online 17 April 2021, Version of Record 17 April 2021.

What do these dates mean?

It takes a village …

However, it delivers significant societal impact.

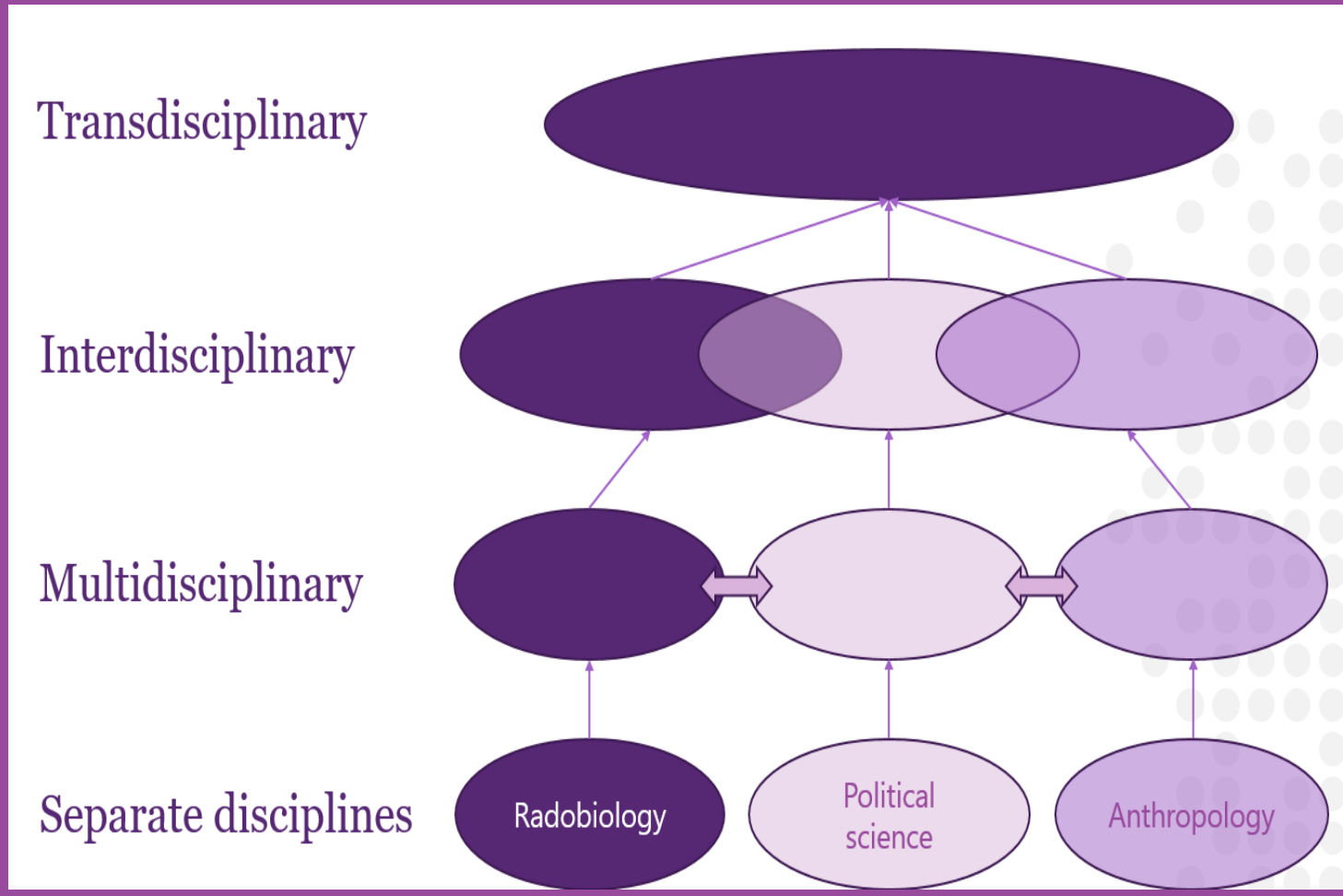
How can disciplines be combined in problem-solving?

Transdisciplinary: creating a unity of intellectual frameworks **beyond the disciplinary perspectives**. Combines interdisciplinarity with a participatory approach.

Interdisciplinary: integrating knowledge and methods from different disciplines, using a real synthesis of approaches.

Multidisciplinary: people from different disciplines working together, each drawing on their disciplinary knowledge.

Interdisciplinary: working within a single discipline



Jensenius (2012);
Jamchandani, 2017

What is here for YOU?

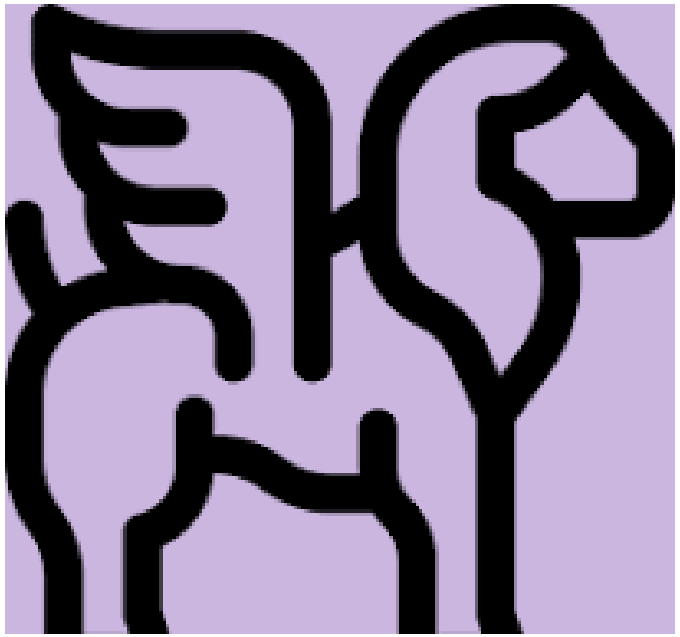
Social Sciences and Humanities (SSH) are **essential disciplines**.

Since challenges extend **beyond technical aspects**, advancing society requires addressing complex that are deeply connected to broader societal issues. **socio-technical questions**

Enrich your PhD research by collaborating with diverse disciplines.

Common myths about social science and humanities

- "Social science is a single discipline"

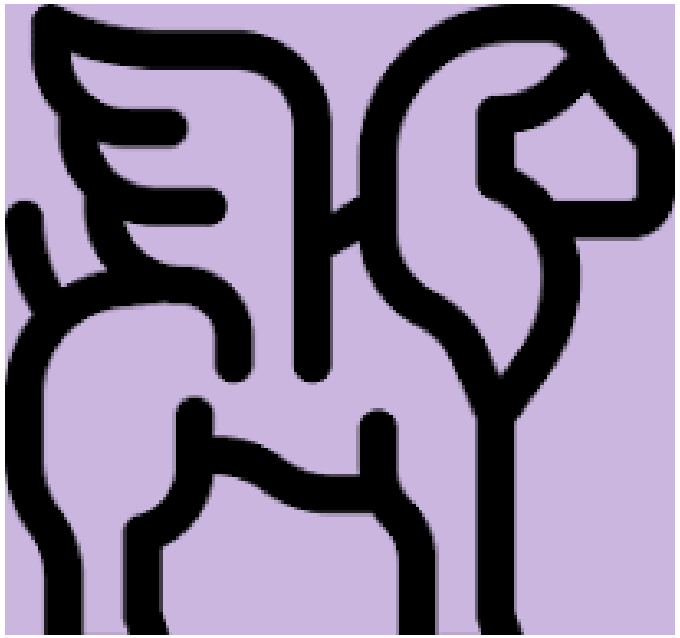


SSH researcher interviewing residents of a remediated legacy site
Method: face-to-face public opinion survey (CAPI)

Social science, those **disciplines** that deal with **human action in its social and cultural aspects,** can contribute significantly and meaningfully to the management of radiological exposure situations.

Figure source: Hydropoliticacademi.org

Common myths about social science and humanities



- "Social science is a single discipline"
- "The social scientist in a group is automatically the public or societal spokesperson"
- "Social science is not real science“
- "Social scientists are biased“
- "Social science is easy“
- "Social science doesn’t have practical applications“

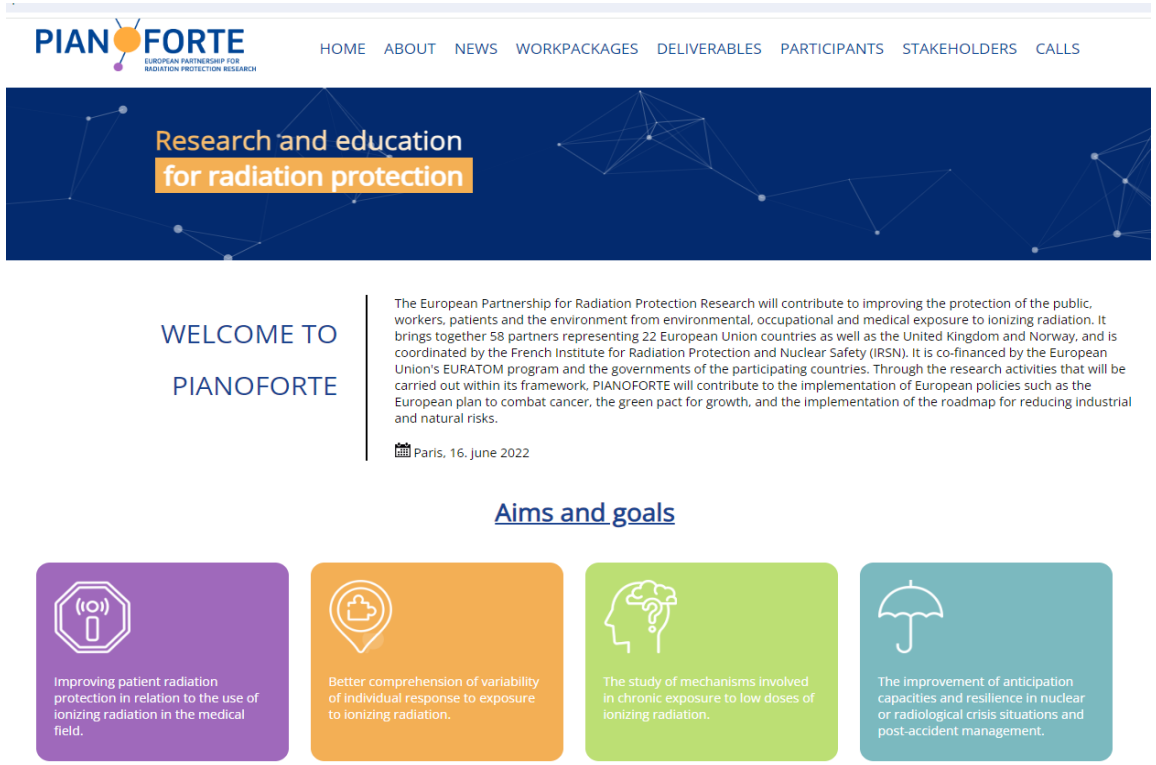
Lack of SSH involvement and lack of collaboration between disciplines

Martell, Perko et al (2022): **Lessons being learned from the Covid-19 pandemic for radiological emergencies and vice versa: report from expert discussions, DOI** 10.1088/1361-6498/abd841

Turcanu, Perko et al (2013): **Public participation processes related to nuclear research installations: What are the driving factors behind participation intention?**

Collaboration is required in research projects

https://pianoforte-partnership.eu



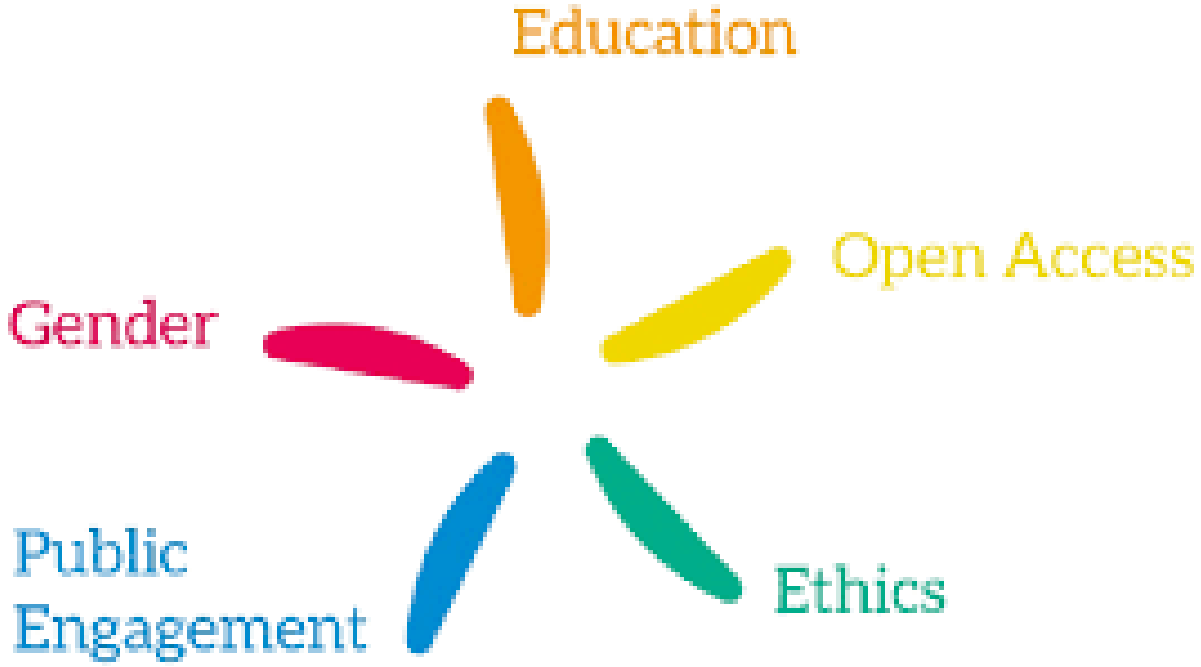
Towards inter- and transdisciplinary research

Guiding questions for reviewers evaluating interdisciplinary proposals

- does the proposal specify clearly why an interdisciplinary approach is needed, which type of interdisciplinary approach is envisaged and which disciplines should be involved?
- does it describe how the disciplines involved will be integrated (in the design and conduct of the research as well as in subsequent publications) and how this relates to the type of interdisciplinarity involved; does it demonstrate how the quality of integration will be assured?
- is the leadership role and management strategy to deliver the desired outcomes clearly articulated?
- do the researchers involved have demonstrable interdisciplinary skills and experience? In particular, is there evidence of interdisciplinary leadership?
- is there an appropriate plan for stakeholder/user engagement from the outset of the project (this will usually be more of an issue for problem-focused interdisciplinary projects)?
- does the proposal budget for, and justify, the additional resources needed?
- is it clear how interdisciplinarity will be reflected in the project outputs and outcomes?"

Responsible Research and Innovation

https://rri-tools.eu



"Societal actors work together during the whole research and innovation process in order **to better align both the process and its outcomes, with the values, needs and expectations** of European society." (EC, 2012.)

Responsible innovation considers the role that new products, processes or business models have in society. This means a responsible approach towards innovation involves creating change that has positive impacts on society and the environment.

Stilgoe et al. (2013)

What is here for YOU?

All New Europe and similar international research & innovation projects must address societal aspects.

Upon completing your PhD, you'll know how to conduct research both **for** society and **with** society.

Research teams will need you!

Example:

https://www.radonorm.eu/workpackages

Objectives

The RadoNorm project under EURATOM Horizon 2020 aims at managing risks from radon and NORM exposure situations to assure effective radiation protection based on improved scientific evidence and social considerations.

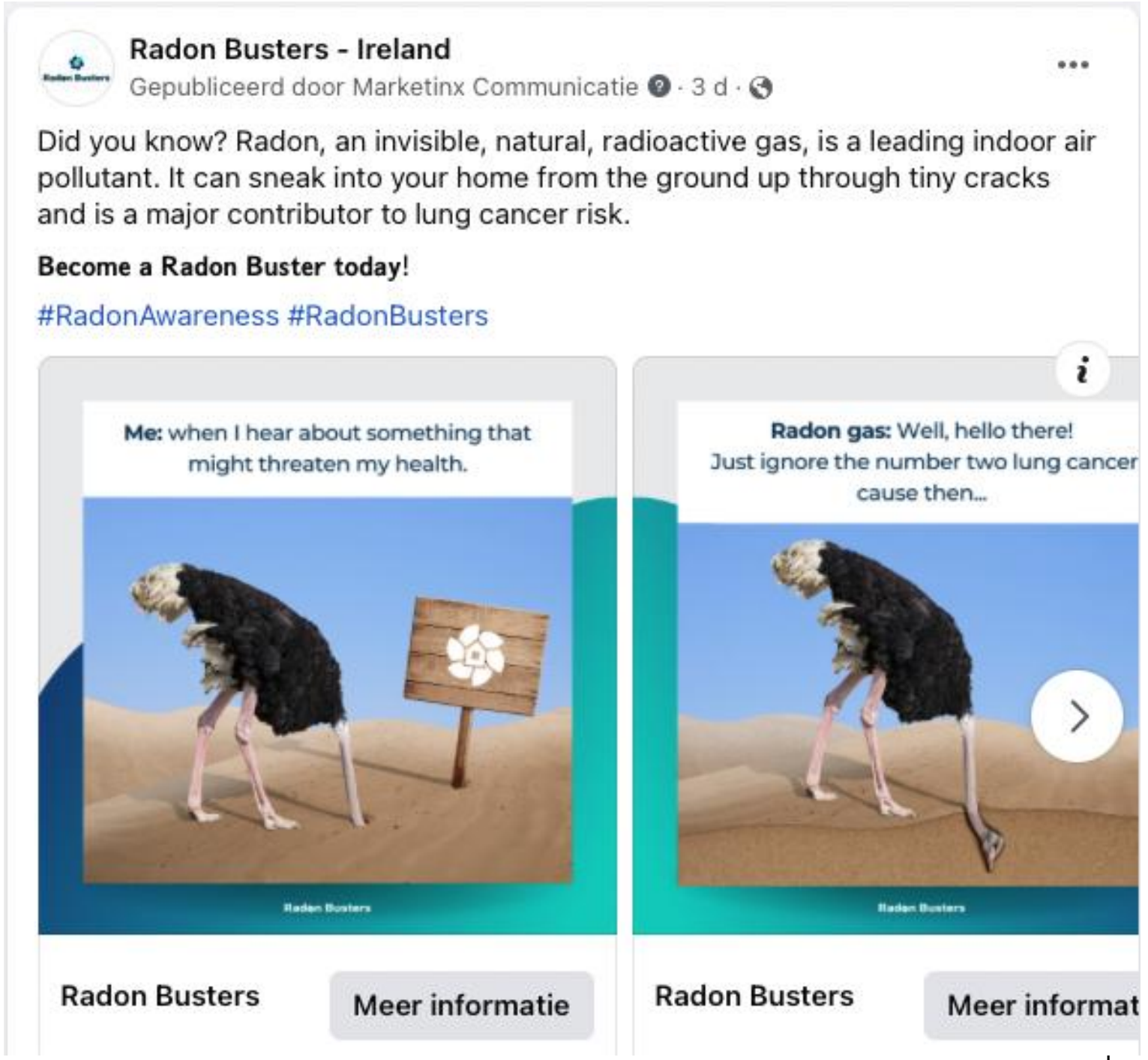
RadoNorm aims to reduce scientific, technical and societal uncertainties by:

- initiating and performing research and technical developments,
- integrating education and training in all research and development activities,
- disseminating the project achievements through targeted actions to the public, stakeholders and regulators.

"

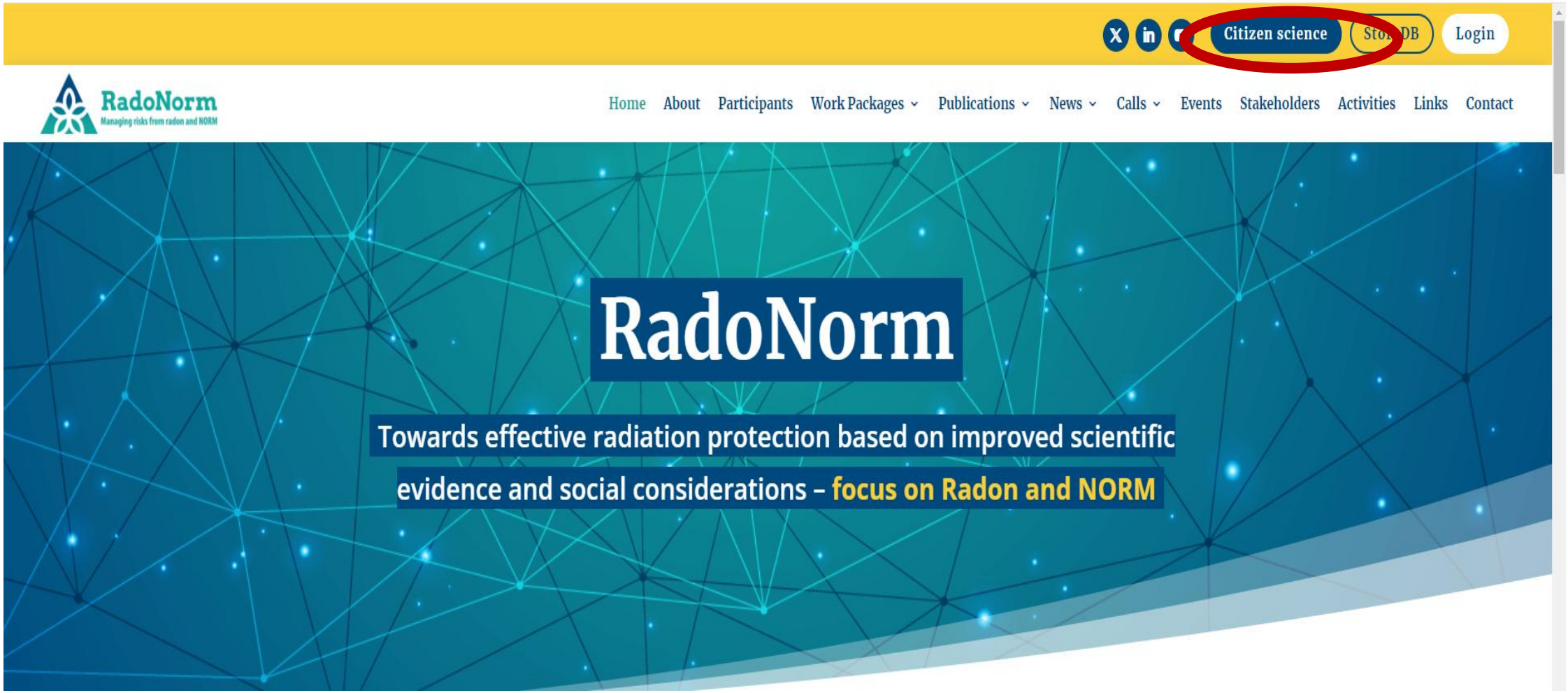
Have you ever heard about radon? What about naturally occurring radioactive material?

Results of interdisciplinary research



Example:

https://www.radonorm.eu/workpackages



Results of a transdisciplinary research

VIDEO:

https://www.sckcen.be/en/news/radonorm-featured-prestigious-list-europes-best-citizen-science

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Evaluating citizen science projects: insights from radon research

Mabel Akosua Hoedoafia[1], Meritxell Martell[2]* and Tanja Perko[1,3]

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https://calls.ars.electronica.art/2024/prix/winners/10721/

Why not involve citizen scientists in your PhD research?

https://rapidresponserevival.com/getting-citizen-scientists-to-map-aeds/

Communication of uncertainties related to radiological risk ...

1 mrt 2023 — Communication of **uncertainties** related to radiological risk situations ; Mentor. **Perko Tanja** ; Promotor. Thijssen Peter ; Kandidaat. **Hoti Ferdiana** ...

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Communication of uncertainties in radiological risk situations

door F Hoti Krasniqi · 2023 — Tanja **Perko**. **Tanja**, you already know you've been such a pain in the neck for me throughout this PhD journey, yet you've been the person I've admired and.
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Radiation risks and uncertainties: a scoping review to ...

door F Hoti · 2020 · Geciteerd door 9 — Radiation risks and **uncertainties**: a scoping review to support communication and informed decision-making, **Ferdiana Hoti**, **Tanja Perko**, Peter

Challenges in communication between different disciplines

- **Attitudes** and different **motivations**;
- **Financial** and **time constraints**: finding a balance between science for the purpose of gaining knowledge ("It is interesting…") and science for the purpose ("What is sufficient…");
- No common **language** and low understanding;
- Low level of **trust** and understanding between disciplines;
- …

(Perko & Martell, 2019)

The PhD Journey:
Navigating life in multidisciplinary research

- Nazanin

End (6.29):

How to bridge the communication gap between different disciplines

- **Reductionism**: restructure disciplinary knowledge to fundamental knowledge. This means that specific concepts, theories and models, etc. should be translatable into language or theories of other disciplines.

- **Simplification**: seeks a common basis in everyday knowledge through the use of metaphors, images, common-sense understanding of what matters and is useful.

- **Modularization:** divides up an interdisciplinary project into mono-disciplinary modules or sub-projects, for instance. A well-designed organization, regular exchange and flexible arrangements are a precondition for an effective result.

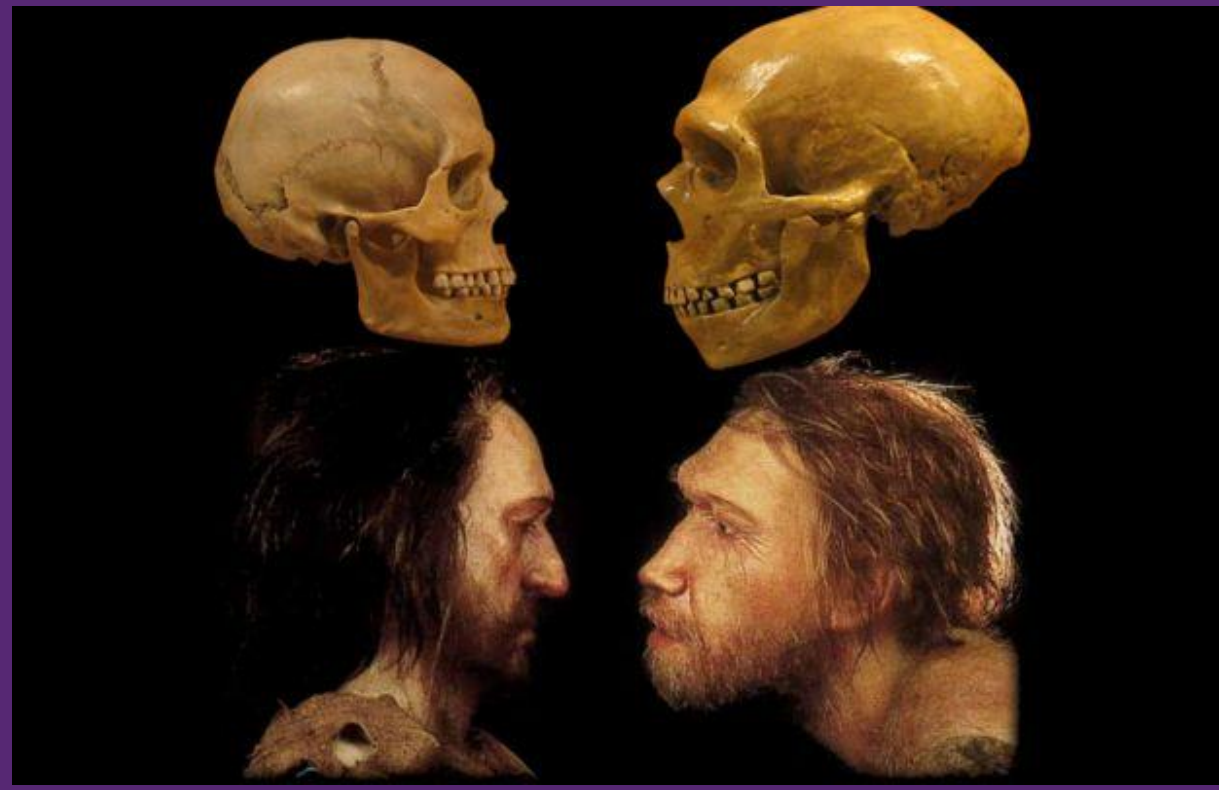
- **Facilitation or mediation**: a mediator translates the questions and results not only between disciplines but also between opinions.

Schummer, 2008

Reasons **your participation** in inter-,multi-, transdisciplinary projects **is valued**

As an SSH researcher:

- You understand how **people work together** to create knowledge.
- You know a lot about people's **attitudes and behaviors**.
- You are **aware of your own biases**.
- You can **critically reflect** on your research.
- You understand research **ethics**.
- You are a great **communicator**.



Break disciplinary boundaries.
Embrace **collaboration,** multidisciplinarity, and transdisciplinary research.

Together we are better!

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Breaking disciplinary boundaries:

Embracing collaboration, multidisciplinarity, and transdisciplinary research

Tanja Perko, University Antwerp and Belgian Nuclear Research Center

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Thank you for your attention