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Multidisciplinary training for Big Science Organizations: creating a European Big Science Masterclass program

Simone Arnaldi
Department of Political and Social Sciences

Exploring the nexus between
Big Science and Science Diplomacy
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Big science and trans-science

Science and Trans-Science

ALVIN M. WEINBERG

MUCH has been written about the responsibility of the scientist in resolving conflicts which arise from the interaction between science and society. Ordinarily the assumption is made that a particular issue on which scientific knowledge is drawn into the resolution of a political conflict—for example, whether or not to build a supersonic transport (SST) or whether or not to proceed with a trip to the moon—can be neatly divided into two clearly separable elements, one scientific, the other political. Thus the scientist is expected to say whether a trip to the moon is feasible or whether the SST will cause additional skin cancer. The politician, or some other representative of society, is then expected to say whether the society ought to proceed in one direction or another. The scientist and science provide the means; the politician and politics decide the ends.

Weinberg argued that modern societies increasingly face questions that look scientific, but cannot be answered by science alone — because they involve uncertainty, ethics, values, or political judgment.

These questions are therefore ***trans-scientific.***

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BSOs generate **a lot** of trans-scientific questions, such as:

- How do we balance national interests with global scientific goals?
- How much public money should we invest and for how long?
- What are the acceptable environmental or geopolitical risks?
- When are industrial spillovers good enough?
- Who should have access to the data and technologies developed?
- What collaboration models with and between BSOs are sustainable?

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BSOs, policy context and training

• How do we balance national interests with global scientific goals?	
• How much public money should we invest and for how long?	
• What are the acceptable environmental or geopolitical risks? • When are industrial spillovers good enough?	
• Who should have access to the data developed?	
• What collaboration models with and between BSOs are sustainable?	

• How do we balance national interests with global scientific goals?	Governance
• How much public money should we invest and for how long?	
• What are the acceptable environmental or geopolitical risks? • When are industrial spillovers good enough?	
• Who should have access to the data developed?	
• What collaboration models with and between BSOs are sustainable?	

• How do we balance national interests with global scientific goals?	Governance
• How much public money should we invest and for how long?	Financing
• What are the acceptable environmental or geopolitical risks? • When are industrial spillovers good enough?	
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• How do we balance national interests with global scientific goals?	Governance
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• What are the acceptable environmental or geopolitical risks? • When are industrial spillovers good enough?	Impact and expectations
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• Who should have access to the data developed?	Data management
• What collaboration models with and between BSOs are sustainable?	Ecosystem

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“Policy issues and options” (OECD 2023)

This combination of challenges demands **multidisciplinary training and skills** for facing them.

Social Sciences and the Humanities have an important space in these set of skills and competences.

- Governance
- Financing
- Impact and expectations
- Data management
- Ecosystem

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Establishing a European Big Science Masterclass program: a bottom-up initiative

A bottom-up initiative to:

- explore the key issues related to skills and competences required for addressing these multiple challenges faced by BSOs;

- build a network of experts and organizations to deliver training activities providing skills and knowledge to tackle these issues.

A bottom-up initiative to:

- explore the key issues related to skills and competences required for addressing these multiple challenges faced by BSOs; ——> **RESEARCH**

- build a network of experts and organizations to deliver training activities providing skills and knowledge to tackle these issues. ——> **TRAINING**

Two main audiences:

- Students and early career researchers in STEM, to broaden their skills and competences as they seek career paths in BSOs;

- Professionals, to provide capacities for the management of organizational processes in BSOs and their relations with the political/economic/social environment.

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A multidisciplinary approach, centered on Social Sciences and Humanities:

- Law
- Economics
- Political science and diplomacy
- Sociology, science communication, public engagement
- Ethics
- […]

Workshop "Training for and with Big Science Organizations" (@University of Granada): • Thematic areas: Economics, Law, Political science and science diplomacy • Horizontal areas: Industrial partnerships, Career paths	November 2025
Training needs in Big Science Organizations: a systematic review (@Universities of Genoa and Trieste)	March 2026
Training workshop @Xcitech School on Science and Technology (Granada)	June 8-12, 2026 (exact date TBA)

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Pilot short training course on issues identified through the preceding research	Spring 2027

Building the network together

- The **multifaceted challenges** of BSOs **require multidisciplinary knowledge** to tackle them.
- The **European Big Science Masterclass program** is **a bottom-up initiative** to develop this multidisciplinary knowledge base.
- **Social Sciences and Humanities** have a key role in addressing managerial challenges of BSOs and **trans-scientific questions** pertinent to their activities.
- The European Big Science Masterclass program aims to **build a European network** of universities, Big Science Organizations, and ILOs committed to **bridging the gap between academic training and the professional needs** of Big Science.
- **The upcoming workshop in June 2026 will bring together stakeholders to discuss** priorities, share expertise, and shape the next steps of the initiative.
- **Contact us to learn more or to stay informed about upcoming activities.**

Thank you for your attention!

Simone Arnaldi

sarnaldi@units.it

www.units.it