# PARADOXES AND PUZZLES OF/IN CITIZEN SCIENCE

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**Abstract:**
Citizen science (CS) can be broadly defined as a process in which nonexperts engage in scientific research or data collection with or without the support of science professionals (Irwin 1995; Bonney et al. 2009). Whereas the concept of CS in science is currently in vogue inside and outside science and research (Kulleberg & Kasperowski 2016), it can – and typically does – take on multiple forms, giving rise to tensions, contradictions, paradoxes, and puzzles. For instance, credentialed scientists may mobilize lay citizens to assist with scientific observations and classifications. While this contributory approach to CS is likely to yield valuable scientific data, it risks closing down opportunities to develop a genuine public engagement culture in which citizens and scientists co-create research problems, agendas, and policies. Elsewhere, some scientists engage 'in their free time' in their own research activities. To what extent might the output of these activities be classed as 'Citizen' or 'Professional' science and what impact does this have on what is produced?
The notion of CS itself is paradoxical as it embeds divergent notions of science, citizenship, and democracy (e.g., invited versus self-organized and more politically-laden citizen engagement), which stakeholders must negotiate or 'work out' through exchanges between them. Examples pertain to the language stakeholders use to make sense of mutual engagements (Eitzel et al. 2017), the technologies and material arrangements (e.g., forms of infrastructure) that come into play (Gabrys 2021), the boundaries that are drawn around what counts as CS (Ottinger 2010), and the "data politics" (e.g., a commitment to open data) that shape these data and which can have profound scientific and social implications (Beraldo & Milan 2019).
Recognizing the essentially contested nature of the CS concept and its manifold practices, this panel invites contributions that theorize or empirically explore the different meanings of CS with a specific focus on the tensions, riddles, and paradoxes found in CS theory and practice. It invites panelists to consider these and related questions:
- What are the foundational tensions and paradoxes at the heart of CS?
- Where do we find these tensions and paradoxes?
- How are they sustained, resisted, transformed?
- How should we imagine these tensions and paradoxes?
- What do these paradoxes do – or not do?
- What are better ways of managing or navigating them – and why?
- How will these tensions and paradoxes play out in the future?
- How can rethinking CS contribute to different and perhaps healthier relations between those doing science?
- Can we expect – and should we anticipate – new paradoxes emerging in/from CS in the short and distant future?
Such questions help to open up consideration about the politics of CS and the role of citizens in technoscientific futures, as CS continues to gain traction in the worlds of policy, research, and innovation; and publics continue to engage with science and technology in manifold ways.

**Key words:**
Citizen Science; Paradox; Politics