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Peak Geoscience or Crisis of Geoscience?

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The session abstract states a considerable lack of newly acquired 'great theories' or major breakthroughs since the 19th and 20th centuries, and asks whether we might have reached peak science. This would indeed mean that we have – finally and at last – reached complete truth and knowledge, i.e. that there are not much more geoscientific fundamentals to explore and find out.
We state the contrary. If we take the hypothesis of the Anthropocene seriously, we face immense theoretical challenges: How can we continue to think humans – ourselves – as being discrete and external to natural processes? How can we understand geological and geomorphic processes by including humans as major geological and geomorphic force?
We are currently facing a major shift in our understanding of the Earth (system). The question thus is not whether we have reached peak science, but why there hasn't been any considerable theoretical breakthrough in the geosciences for so long. We argue that this is due to the combination of two related, yet distinct modes of operation of science. (1) According to Thomas S. Kuhn and Imre Lakatos, scientific progress is guided (and in Kuhn's notion also hindered) by paradigms or research programs. When paradigms or research programs are at their peak, Kuhn would address this as 'normal science', in which the focus of research is on case studies rather than on theoretical progress. At the same time, Lakatos argues that 'old' theories can only be challenged by new theories, not by data. In order to change scientific theories, we thus need theoretical endeavours. (2) Currently, nearly all sciences are characterised by an ever-increasing demand to publish more and faster (or otherwise perish), whilst this pile of publications can rarely be read, considered, and criticised, because everybody is too busy publishing. We thus are not only in a phase of 'normal science', but also of 'fast science'. We are more concerned to meet (externally or internally) set performance targets than to conduct deep, curiosity-driven research that implies the possibility to fail and that also allows to focus on outliers in data.
To conclude, whilst we face major challenges in the face of the Anthropocene, with the imperative to re-think our major (geoscientific) theories, we are not fit to meet these challenges. Instead of peak (geo-)science we experience a crisis of (geo-)science.