# Earth System in Crisis

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Science begins to draw a consistent picture of the past co-evolution of (i) the planetary environment, and (ii) human civilization. Unfortunately, the latter has turned into a geological force now, as epitomized by the "Anthropocene" notion. As a consequence, modern research urgently needs to explore also (iii) Earth system change as driven by anthropogenic forces. These forces are transforming the Arctic before our very eyes.

In all the three contexts mentioned, nonlinearity and irreversibility play crucial roles. My lecture will highlight this finding from various perspectives. Remarkably, the cryosphere is a key to that analysis.

The first part of my talk will look back into the past, focusing on paleo-climate dynamics, on the one hand, and on the emergence of modern societies through fossil fuel use, on the other hand. The second part will address the so-called tipping elements in the planetary machinery, which may be modified / annihilated by anthropogenic global warming and other human perturbations. The last part will discuss the ambitious Paris Agreement on climate action and particularly explore how the associated targets might still be met.

I will conclude with a couple of quotes from Pope Francis, who has made sustainability a cornerstone of his spiritual mission.