Announcement of a topic for:

Seminar Research   **X**
Seminar Methods   **X**
Master Theses   **X**   (please mark one or more)

Topic	The parametrization of climate modules in integrated assessment models of climate change: State of the art or old hat?
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Description	Policy-optimization integrated assessment models of climate change (IAMs) combine models of the global economy with simple climate modules that feature representations of the carbon cycle and energy balance. By trading-off parsimony with realism IAMs aim at including the full range of effect in climate change in a tractable manner to estimate costs and benefits of alternative climate policies or the social cost of carbon. While IAMs are increasingly influential in policy applications, their climate modules have been criticized to be overly simplistic and not in line with state-of-the-art earth system modelling used in the latest IPCC AR6 report. The aim of this Master Thesis is to compare, test and evaluate climate modules of the most prominent policy optimization IAMs by implementing suitable hindcasting experiments.
Literature	Christian Azar; Daniel J. A. Johansson (2021): DICE and the Carbon Budget for Ambitious Climate Targets. In: Earth's Future 9 (7), e2021EF002041. Fujimori, Shinichiro; Dai, Hancheng; Masui, Toshihiko; Matsuoka, Yuzuru (2016): Global energy model hindcasting. In: Energy 114 (1–2), p. 293–301. Mattauch, Linus; Matthews, H. Damon; Millar, Richard; Rezai, Armon; Solomon, Susan; Venmans, Frank (2020): Steering the Climate System. Using Inertia to Lower the Cost of Policy: Comment. In: The American Economic Review 110 (4), p. 1231–1237. Millner, Antony; McDermott, Thomas K. J. (2016): Model confirmation in climate economics. In: Proceedings of the National Academy of Sciences of the United States of America 113 (31), p. 8675–8680. Timm Faulwasser; Robin Nydestedt; Christopher M. Kellett; Steven R. Weller: Towards a FAIR-DICE IAM: Combining DICE and FAIR Models Wilson, Charlie; Guivarch, Céline; Kriegler, Elmar; van Ruijven, Bas; van Vuuren, Detlef P.; Krey, Volker et al. (2021): Evaluating process-based integrated assessment models of climate change mitigation. In: Climatic Change 166 (1-2), p. 182.