Announcement of a topic for:

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

Topic	Ground-based analysis of ice-microphysics in Arctic boundary layer clouds
Release Date	15 July 2024
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Description:	Mixed-phase clouds can exist at temperatures below 0 ºC and their phase and longevity is influenced by the abundance of ice crystals. The scope of the this work is to use a dataset from active radar/lidar satellite remote sensing stations, e.g. at Barrow, Summit, or Ny Alesund, to investigate the ice crystal concentrations. The first part of the work will focus on applying the DARDAR-Nice retrieval (https://www.icare.univ-lille.fr/dardar/overview-dardar-nice/) to the ground-based observation and to evaluate the performance of the DARDAR-Nice retrieval. The dataset will be used to study pure ice clouds in the boundary layer and the clouds should be separated between a coupled and decoupled state. In the second part of the work the retrieval should be applied to campaign data in the central Arctic, e.g. A02018 or MOSAiC to retrieve ice crystal concentrations.
Literature:	Gryspeerdt, E., Sourdeval, O., Quaas, J., Delanoë, J., and Kühne, P.: Ice crystal number concentration estimates from lidar-radar satellite retrievals. Part 2: Controls on the ice crystal number concentration, Atmos. Chem. Phys., 18, https://doi.org/10.5194/acp-18-14351-2018, 2018. Sourdeval, O., Gryspeerdt, E., Krämer, M., Goren, T., Delanoë, J., Afchine, A., Hemmer, F., and Quaas, J.: Ice crystal number concentration estimates from lidar-radar satellite remote sensing. Part 1: Method and evaluation, Atmos. Chem. Phys., 18, https://doi.org/10.5194/acp-18-14327-2018, 2018 Ewald, F., Groß, S., Wirth, M., Delanoë, J., Fox, S., and Mayer, B.: Why we need radar, lidar, and solar radiance observations to constrain ice cloud microphysics. Atmos. Meas. Techn., 14, https://doi.org/10.5194/amt-14-5029-2021, 2021.