Announcement of a topic for a Master Thesis

can be used in the modules: - P5 - Meteorological Research
- P6 - Meteorological Working Methods

Topic	**EarthCARE observations of wildfire smoke**
Release Date	1 Sep 2025
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Description:	The intense wildfires in Canada (and elsewhere) released huge amounts of wildfire smoke into the atmosphere. Special pyrocumulo-nimbus events lifted the smoke up to the lower stratosphere. The smoke layers are transported over long distances, e.g., towards Europe. The new satellite EarthCARE launched in May 2024 carries an advanced atmospheric lidar (ATLID) which is perfectly suited to study the elevated smoke plumes on a global scale. It provides layer heights and optical properties of the smoke plumes. We have observed that large parts of the Arctic are filled with smoke since June 2025. The topic of the master thesis is use EarthCARE to study the occurrence, lofting and removal processes of the smoke plumes. Furthermore, the interaction of the smoke layers with cirrus clouds is of great interest.
Literature:	Fromm, M., et al., (2010): The untold story of pyrocumulonimbus. BAMS, 91 (9), 1193-1210. https://172doi.org/10.1175/2010BAMS3004.1 Illingworth, A. J, et al., (2015): The EarthCARE Satellite: The Next Step Forward in Global Measurements of Clouds, Aerosols, Precipitation, and Radiation, BAMS, 96, 1311–1332: https://doi.org/10.1175/BAMS-D-12-00227.1 Mamouri, R.-E., et al. (2023): Wildfire smoke triggers cirrus formation: lidar observations over the eastern Mediterranean, Atmos. Chem. Phys., 23, 14097–14114. https://doi.org/10.5194/acp-23-14097-2023