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KEYNOTE: Ice cores, the material ice and flow structures in ice with a view to ice dynamics

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Ice cores provide amazingly detailed and direct view into the interior of our Earth's ice sheets. This complements indirect ice dynamics' observations on and from the surface. Depending on their specific drilling location within the large-scale dynamics ice core samples provide unique insight into the state of the material under natural conditions. Material state properties (grain sizes, crystal orientations etc.) in concert with parameters stemming from the dominating deformation processes define the rheological response of the ice deformation, as one component of ice flow. Principles and theory on these processes can explain the needed parametrization in flow laws. Advances in measurement and data processing methodologies on all scales in the last decade allow meaning full combination of the detailed knowledge from the microscale to large-scale observations. Particularly flow and deformation structures from targeted drillings aimed predominantly at understanding ice dynamics and from their larger setting around the drill site provide partly surprising insight. Understanding some of these structures now increases our understanding e.g. of the North East Greenland Ice Stream with EastGRIP being the first "ice dynamics core". However, also the documentation of palaeo-climate will profit from structural understanding, as they are the most straight forward access to evaluate stratigraphic integrity.

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