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ROCKY MOUNTAIN OUTLOOK

Swiss researcher to join snow and ice speakers' series

By Lynn Martel - Rocky Mountain Outlook

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Science is triggered by the wish to learn more.

So says Dr. Tobias Jonas, head of the snow hydrology research group of the WSL Institute for Snow and Avalanche Research in Davos, Switzerland.

A physicist whose field of expertise includes monitoring and modelling of snow water resources and melt water discharge from alpine basins, Jonas' studies also focus on climate change effects on catchment hydrology and hydropower production, as well as snow hydrology of subalpine forests, and snow-climatological effects on plant and animal ecology.

Jonas will visit Canmore next week as the next presenter of the Canadian Rockies Snow and Ice Initiative Speakers Series, taking place on Wednesday, April 7 at Canmore Collegiate High School at 7 p.m. His talk will outline the history and activities of the Swiss Institute for Snow and Avalanche Research, and will highlight research, monitoring and warning services related to snow and avalanches in Switzerland.

"I will present some of our research projects while also addressing the relevance of snow research for the public," Jonas said from his office in Switzerland. "The presentation should also allow a glimpse behind the scenes of operational warning services – what does it require to provide such services?"

Jonas' research involves monitoring numerous research sites, most of which are located in the Swiss Alps. Those sites range from small plots of a few square metres to entire watersheds, he explained, many of which are investigated for a few winter seasons, while some are long-term research sites. Unlike Canadian snow and hydrological researchers who have at best 40 years' worth of data to work with, the Swiss have sites with data stretching back to the early 1900s. Some research, such as that which leads to operational services or products typically deals with data from an existing monitoring network and does not involve much fieldwork.

"The majority of our periodic fieldwork is done in the vicinity of our institution," Jonas said. "A typical day of fieldwork in the winter would involve a trip to a field site by ski. We use all kinds of equipment to measure snow distribution, from simple manual measurements to automatic terrestrial laser scanning devices. We also do discharge measurements in mountain streams, either manually or continuously with fixed installations. There are also plenty of opportunities for fieldwork in the summer season."

The biggest challenges faced by researchers engaged in fieldwork include dealing with avalanche danger and bad weather in general, he said.

"Given the spatial variability of many relevant properties, it requires a huge effort to capture representative data," Jonas said. "That and getting instrumentation to survive a winter season out in the mountains are our main challenges."

Challenges aside, the rewards of fieldwork and the data it generates are many, he added.

"Snow hydrology involves interesting aspects of environmental physics," Jonas said. "Our research is relevant for a number of different areas, such as flood forecasting, hydropower production or water



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resource management. And last, but not least, snow is a fascinating research object, and fieldwork typically involves a lot of fun."

And, he added, the desire and drive to learn more is omnipresent. Among his current projects are efforts to enhance spatially-distributed snow cover and snow melt models, and improvement of his team's quantitative understanding of snow-vegetation interactions.

While visiting Canmore, Jonas said he looked forward to sharing his group's research and to meeting and exchanging experiences including fieldwork with snow scientists currently conducting research in the Canadian Rockies, particularly Dr. John Pomeroy, Canmore-based head of hydrology for the University of Saskatchewan's Centre for Hydrology.

The fifth speaker in the series, Jonas said he would also welcome questions with the same enthusiasm that has generated much stimulating and enlightening discussion at previous CRSI presentations.

Admission is free, refreshments will be served afterward.

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