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Research in Graubünden

Of deer, chatbots and blood samples

Award-winning research across disciplines



Photo caption: From left: Barbara Haller Rupf and Britta Allgöwer (Academia Raetica), Christian Ehrbar (Canton of Graubünden) and award winners Raphael von Büren, Carole Schöpfer, Marta Santolini, Giulia Soldati, Serena Duranti and Angela Heldstab. Front: Daniela Heinen (conference organiser). Not pictured: award winner Nicolò Marchi. Photo: Clemens Güdel.

Red deer as promoters of biodiversity, artificial intelligence in Romansh and the prospect of less invasive medical examinations: the topics presented at the public science event ‘Graubünden forscht’ on 6 and 7 November in Davos demonstrated the diversity of research conducted in and about Graubünden. Six presentations particularly stood out.

Raphael von Büren from the Swiss National Park works with an exceptional wealth of data: vegetation surveys of 129 plots, some dating back to 1917. Since the park was placed under full protection and red deer returned, plant diversity in unforested areas has increased considerably. While deer can threaten the regeneration of young trees in managed forests, they promote biodiversity here. Climate warming, however, partially reverses this positive effect.

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Carole Schöpfer from the WSL Institute for Snow and Avalanche Research SLF focuses on life beneath our feet. In experiments conducted on alpine meadows around Davos, artificially induced warming alone had little effect on the number of springtails. When above-ground insect numbers were reduced at the same time, springtail numbers more than doubled. Environmental changes can therefore have very different effects when acting in combination rather than individually. Getting people excited about these tiny soil-dwelling creatures is not easy: 'Furry mammals with big eyes are easier to market,' says Schöpfer.

Two studies focus on multilingualism. **Serena Duranti and Giulia Soldati** from the University of Teacher Education Graubünden conducted group discussions with sixth-grade pupils, teachers and parents in German-speaking Graubünden. All three groups expressed positive attitudes towards Italian. The children in particular experience the language not only as a school subject but also as part of everyday life in Graubünden. Further surveys will explore how attitudes, emotions and motivation to learn relate to their proficiency in Italian.

To enable AI chatbots to converse in Romansh and Ladin, **Angela Heldstab** from the University of Zurich is working within a research group to develop suitable training data. People with the relevant language skills correct machine-translated questions and answers in nine language varieties. Recruiting enough contributors and funding their work is a challenge. Heldstab is particularly pleased with the recognition 'also as someone from the Prättigau'.

Nicolò Marchi from CK-CARE is working within a research group to investigate tiny vesicles released by cells in the body, whose contents may provide clues to diseases. By combining existing methods, these vesicles can be more effectively separated from other blood components and analyzed more reliably. If reliable markers of chronic inflammation of the esophagus can be identified in these vesicles, blood tests could one day replace repeated endoscopies with tissue sampling to monitor the progression of the disease.

Marta Santolini from the AO Research Institute Davos investigates how intervertebral discs respond to repeated torsional loading. An initial laboratory experiment using bovine intervertebral discs provided indications of inflammatory responses and the breakdown of tissue components. The outer fibrous ring appeared to be particularly sensitive.

Academia Raetica presented six Scientific Awards, each worth CHF 450. Through 'Graubünden forscht', it provides a platform for young researchers and promotes exchange across disciplines and with the public.

Daniela Heinen