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Mechano-X

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Abstract

In this presentation, I will outline representative past, present, and future research activities from our Mechano-X Labs [1]. Leveraging the Mechano-X paradigm [2] -where X spans multiple thematic directions- I will discuss several Mechano-X topics, including X = nanomaterials, nanosurfaces, metamaterials, bioinspiration, bionics, microsystems, up to snow avalanches and climate-change-related effects. These examples will showcase how mechanical factors act as a unifying thread across scales, materials, and applications, driving advances in our interdisciplinary research agenda. [1] Nicola M. Pugno, "Mechano-X Labs", Mechano-X Workshop 2026, January 4-7, 2026, Tsinghua Southeast Asia Center, Bali, Indonesia (organized by Mechano-X Institute, prof. H. Gao). [2] Yujia Wang, Guijin Zou, Huajian Gao, Mechano-X: A paradigm for mechanics-based interdisciplinary innovation, MechanoEngineering 1, 010801 (2026). NMP is suppoted by the ERC-2024-ADG FRAMEGLOW: "Advanced Quantized FRActure MEchanics models of ice and snow for GLObal Warming risk mitigation", Grant agreement ID: 101201568.

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