



## **RISE-6G Project: Toward Smart 6G Connectivity with Reconfigurable, Intelligent, and Sustainable Wireless Environments**

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The design of 6th Generation (6G) wireless networks points towards flexible connect-and-compute technologies capable to support innovative services and use cases. Targeting the 2030 horizon, 6G networks are expected to pave the way for sustainable human-centered smart societies and vertical industries. Wireless networks will be transformed into distributed smart connectivity infrastructures, where new terminal types are embedded in the daily environment. A key element toward building smart and energy sustainable wireless systems beyond 5G is the reconfigurable intelligent surface, which offers programmable control and shaping of the wireless propagation environment. In this context, the RISE-6G project aims at investigating innovative solutions that capitalize on the latest advances in the emerging technology of Reconfigurable Intelligent Surfaces, offering dynamic and goal-oriented radio wave propagation control and, enabling to trade off dynamically diverse, and usually conflicting, connectivity objectives. The RISE-6G project focus on: i) the realistic modeling of RIS-assisted signal propagation, ii) the investigation of the fundamental limits of RIS-empowered wireless communications and sensing, and iii) the design of efficient algorithms for orchestrating networking RISs, in order to implement intelligent, sustainable, and dynamically programmable wireless environments enabling diverse services that go well beyond the 5G capabilities. In this talk, we discuss the key technological enablers and research challenges with the proposed networking paradigm, and highlight the potential profound role of RISs in the recent Open Radio Access Network architecture. Details on two unprecedented envisioned proof-of-concepts for realizing controlled wireless environments in near-future use cases will be presented.