FITNESS

Flexible IntelligenT NEarfield Sensing Skins

Realizing smart flexible surfaces with sparse electronics, using **advanced electromagnetic metasurfaces,** with sensitivity that decreases with distance from the surface.

CONCEPT

The proposed science to technology breakthrough is **an adaptive skin of a few millimeter thickness,** with unprecedented near-field sensing capabilities. The skin is based on the capability of metasurfaces to manipulate reactive fields.

Signal analysis is then expected **to provide a translation from the near-field to far-field environments,** with near-field awareness down to 1 centimeter accuracy. Full coverage with a smart skin will produce a sensing "aura" around the robot or body.
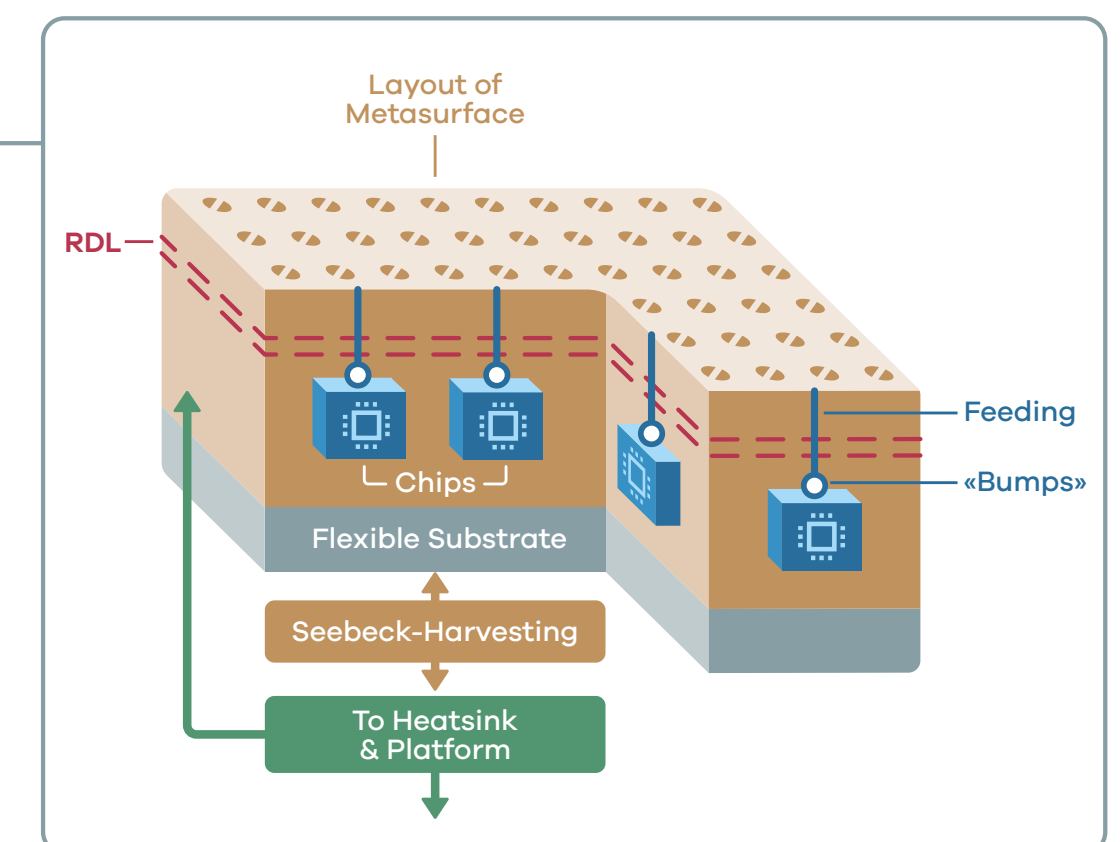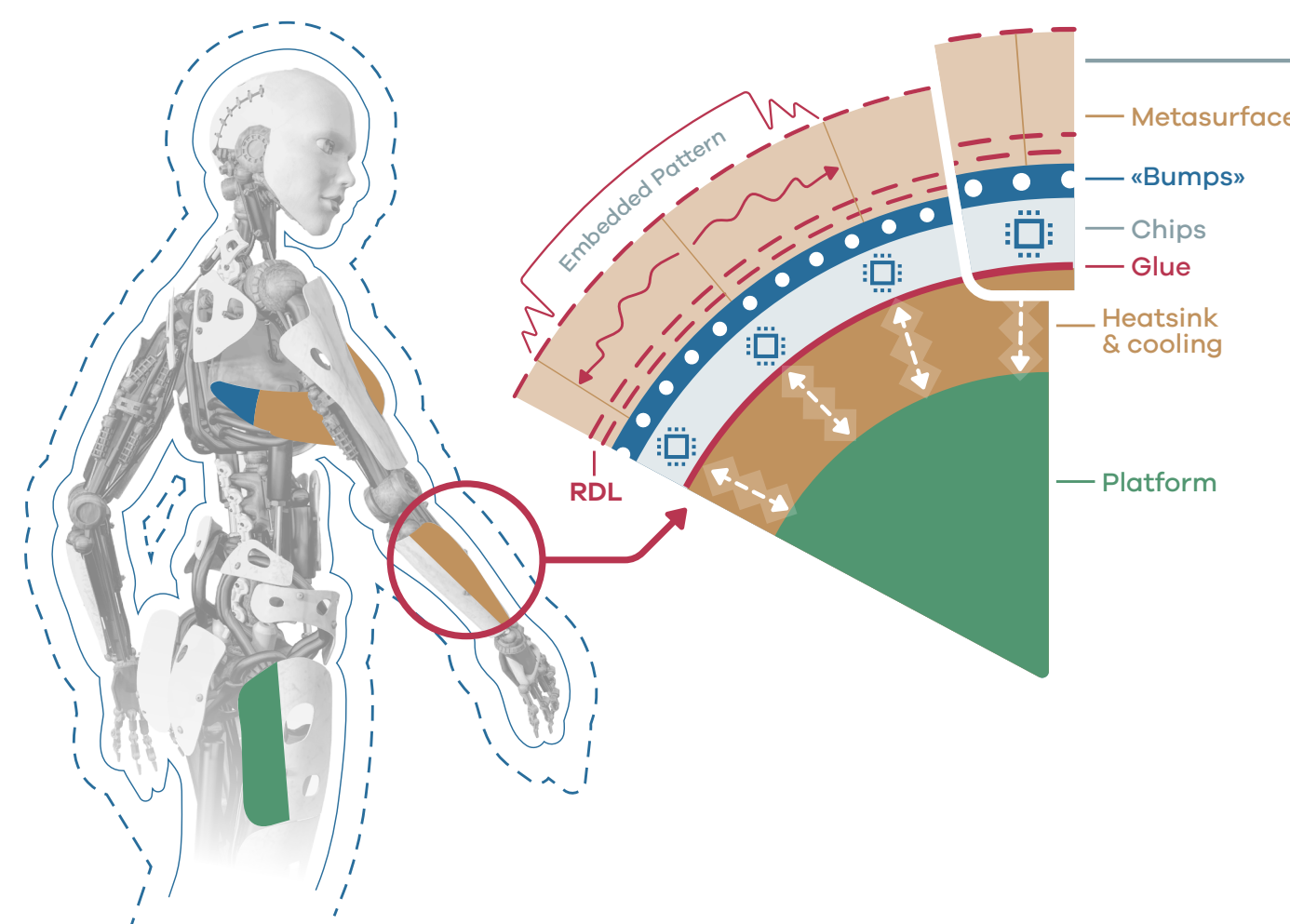
AN INTERDISCIPLINARY PROJECT BY NATURE

FITNESS involves researchers in the fields of **microwaves, materials, electronics, chemistry, electromagnetic waves, etc.** The interactions are numerous and **interface control will be key** toward prototypes of new metasurfaces which will be sparse, conformal, flexible and which will also integrate the electronics, to be applied in the field of robotics.

1. Fabrication interfacing electronics and antennas
2. Flexible curved MTS
3. Curved MTS inheriting from planar one
4. Correlation analysis
5. Heat management
6. Low-loss block copolymer
7. Metallization of flexible substrates
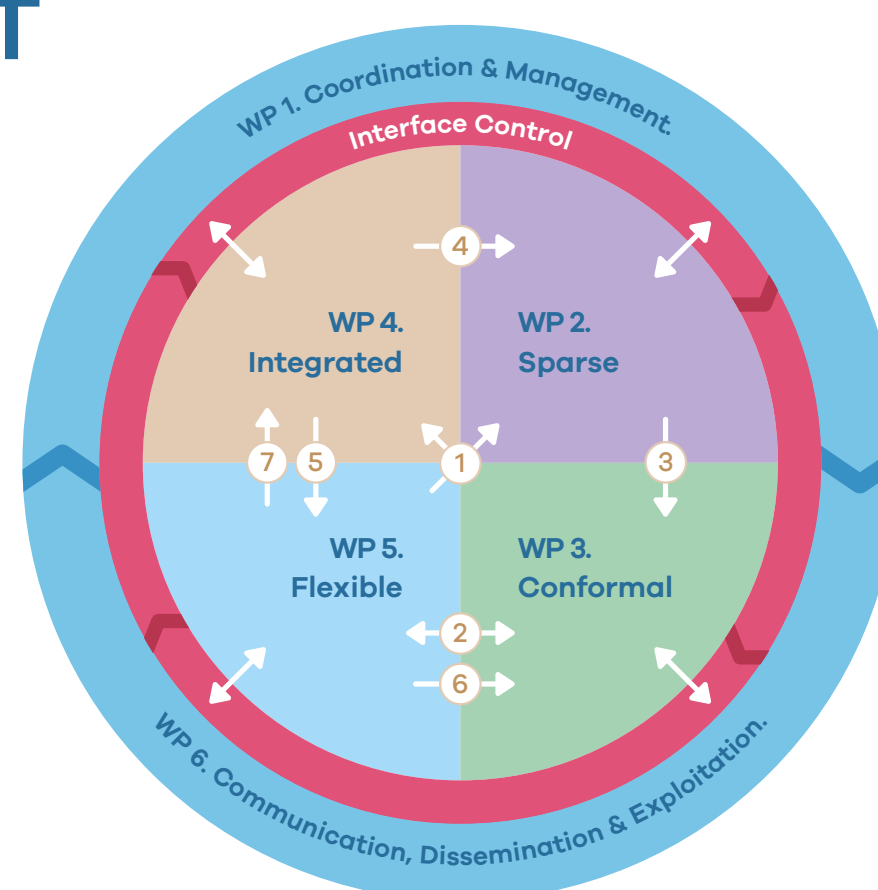
LONG TERM VISION

Redefining the sense of 'touch' of devices with **ultra low-power smart skins,** leading to a transformation in **safe and efficient human-device interaction** that transcends physical limits.

APPLICATIONS

SHORT TERM
ROBOTICS

LONG TERM
ADVANCED HEALTHCARE

Project acronym & title **FITNESS** **F**lexible **I**ntelligen**T** **NE**ar-field **S**ensing **S**kins	GA Number **101098996**	**7 partners**	**4 EU countries**	Project Coordination **Université catholique de Louvain (BE)**	EU requested contribution **3,6 M€**	Starting date **01/04/2023**	Duration **48 months**

CONSORTIUM

UCLouvain • CNRS • Fraunhofer FHR • eV Technologies Think Energy! • FER Fakultet elektrotehnike i računarstva • TUHH Hamburg University of Technology • LUP

DISCOVER MORE
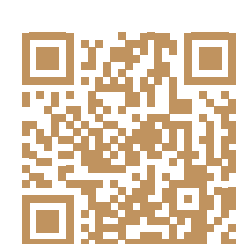
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