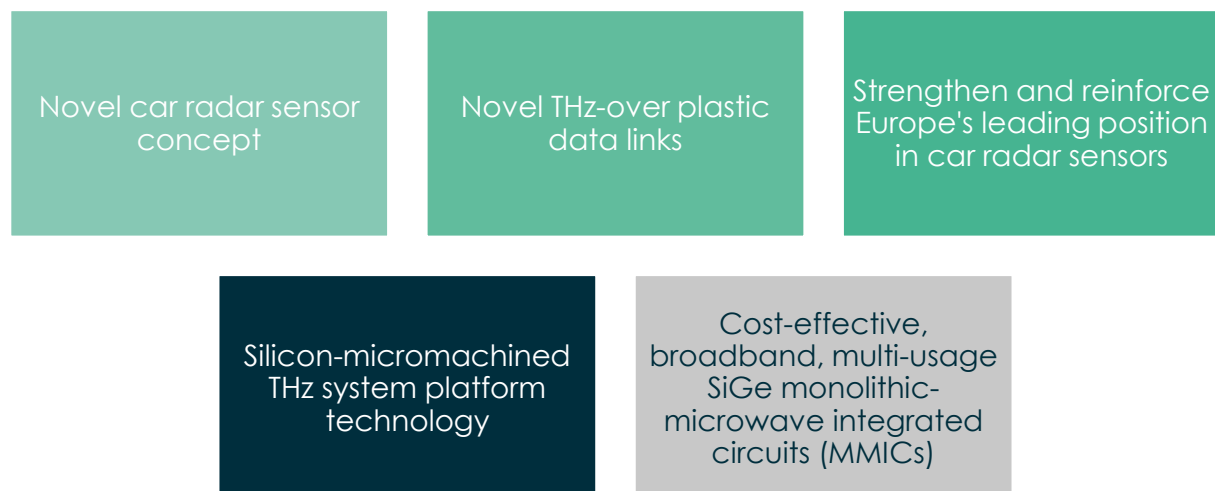


# Car2TERA: Terahertz sensors and networks for next generation smart automotive electronic systems

The European cooperative research project Car2TERA officially started on January 1, 2019. The project team will develop emerging sub-THz (150-330 GHz) smart electronic systems based on latest semiconductor, microsystem and nanoelectronics technologies, and implement Technology Readiness Level - 4 demonstrators in two high-potential application scenarios: a new class of -steering short-range car radar sensors and short-distance, high data-rate THz-over-plastic data links for radio-access and backbone networks facilitating the data growth demanded by future Internet of Things. The project runs for 39 months and receives funding from the European Union under the grant agreement number [824962].

Advanced sensor systems and sensor fusion are the key components in the safe progression from Advanced Driver Assistance Systems (ADAS) to fully Automated Vehicles. Automated driving demands complete in-cabin monitoring of the vehicle. Radar is a key sensing technology for advanced driver assistance systems and automated vehicles due to its strong detection capability, long range, and robustness to environmental variations such as inclement weather and lighting extremes. Current car radar sensor technology, mainly operating in the 24 GHz and 77 GHz bands in FMCW mode, cannot meet the complex challenges for safe driving of automated vehicles and mobile robots.

**Car2TERA** will focus on sub-THz, large bandwidth technologies for advanced in-cabin sensor systems, sensor fusion and high-speed data links and combine the results of recent achievements: (1) monolithic-microwave integrated circuits (MMICs) using 600-GHz- $f_{max}$  SiGe and graphene technology (2) silicon micromachining for system integration, packaging and phased-array antenna front-end (3) integrated MEMS reconfigurability and (4) large-bandwidth, high-linearity graphene MMICs (5) advanced signal processing including OFDM radar signals and AI sensor fusion. Moreover, Car2TERA will focus on the following objectives:



To reach these goals, Car2TERA will provide the means for the innovative breakthrough to meet the following requirement: pushing towards the unexplored bands at sub-THz frequencies. This will allow a significant increase in the RF-bandwidth needed both for telecommunication and remote sensing.

The proposed short-range, sub-THz frequency radar technology will also enable new, emerging applications such as in-cabin sensing and significantly improve outdoor sensing including road-condition monitoring as essential new features towards the assisted and automated driving and improved road safety.

The Car2TERA consortium consists of eight highly qualified industrial and academic partners from various backgrounds and five different countries (*Austria, Sweden, Poland, Italy and Spain*), making it well-positioned to achieve its objectives.

### The Car2TERA partners are:

- TECHNIKON Forschungs- und Planungsgesellschaft mbH, Austria
- KUNGLIGA TEKNISKA HOEGSKOLAN, Sweden
- Infineon Technologies Austria AG, Austria
- CHALMERS TEKNISKA HOEGSKOLA AB, Sweden
- ENT SA, Poland
- ERICSSON TELECOMUNICAZIONI, Italy
- ANTERAL SL, Spain
- Veoneer Sweden AB, Sweden

The official Kick-Off meeting took place from 28<sup>th</sup> – 29<sup>th</sup> January 2019 and was hosted by TECHNIKON Forschungs- und Planungsgesellschaft mbH in Villach/Austria. For more information, please visit [www.car2tera.eu](http://www.car2tera.eu). [coming soon]



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