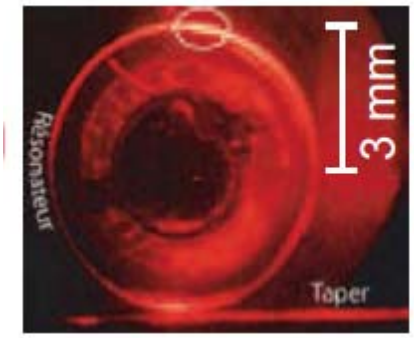
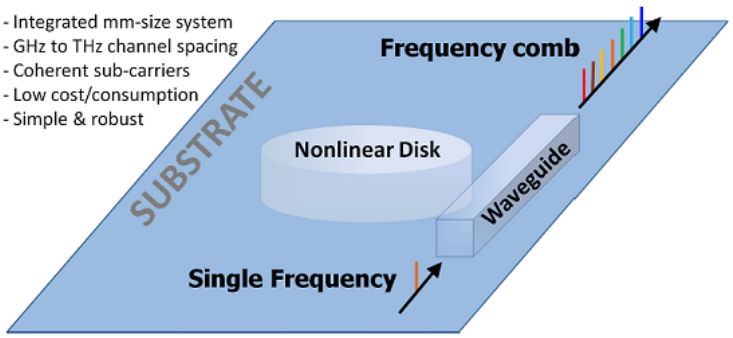
ERC Starting Grant for Franche-Comté

Dr. Yanne Chembo from the FEMTO-ST Institute (UMR 6174 CNRS-Université de Franche-Comté) has received a Starting Grant of 1.4 million euros from the European Research Council (ERC). His project entitled NEXTPHASE (*NEXT generation of microwave PHotonic systems for AeroSpace Engineering*) aims to investigate and implement a new generation of microwave radiation sources using photonic technologies, with the potential to outperform existing oscillators.

ERC Starting Grants aim to support up-and-coming research leaders who are about to establish or consolidate a proper research team and to start conducting independent research in Europe. The scheme targets promising researchers who have the proven potential of becoming independent research leaders. It essentially supports the creation of excellent new research teams, and strengthens others that have been recently created.





Ultra-stable microwave generation in aerospace engineering heavily relies on quartz oscillators, which are still ubiquitous even though they are reaching their ceiling in terms of output frequency, frequency stability and phase noise performance. A breakthrough is needed in order to power the technological shift able overcome these limitations. In this perspective, NEXTPHASE aims to explore one of the most promising and original solution: microwave generation using nonlinear whispering-gallery mode resonators. The advantages of this approach are numerous: conceptual simplicity, higher robustness, lower power consumption, immunity to interferences, versatility for output frequency, and very high potential for chip integration. NEXPHASE particularly aims to investigate the extreme features arising from the cross-disciplinary nature of this new paradigm, both at the theoretical and experimental levels. The global impact of this project is expected to be strong in technology, such as in aerospace engineering, but also in communication engineering, for carrier synthesis, or multi-wavelength coherent sources. NEXTPHASE is also expected to have great impact in fundamental science, like in extreme condensed matter physics, and in cavity quantum electrodynamics.

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