

The future lies in optical fibres



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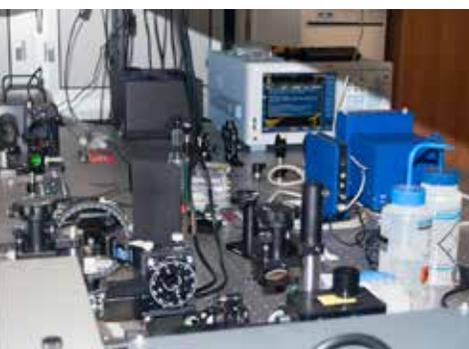
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A recent discovery paves the way for new applications in various fields

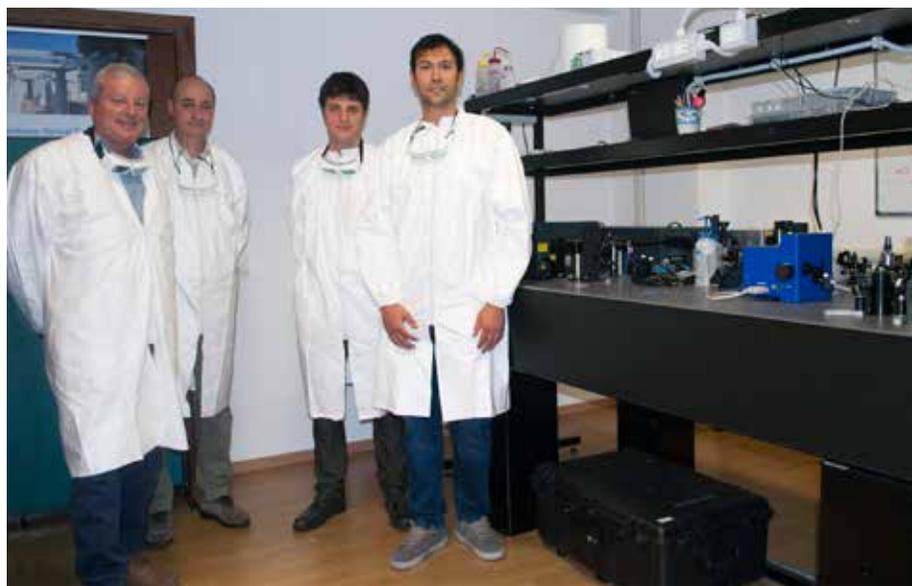


INSTRUMENTATION FOR THE CHARACTERIZATION OF THE LIGHT EMITTED BY MULTIMODE OPTICAL FIBRES

Optical fibres represent a fundamental element for information propagation in various sectors of our life, from robotics to industry, from bio-medicine to everyday social activities: just think about transoceanic cables, actually made up of fibres capable of carrying information all the way across the globe. The fibres used today are of the single-mode type, with a single light beam: this imposes limits in terms of fragility and the amount of information that can be carried through. On the other hand, Multimode fibres, which could dimensionally overcome such problems, entail an additional limit: the modes do not speak each other and then the transmitted images lose both synchrony and definition. A recent discovery, however, could change this. “By increasing the power fed into multimode fibres, we have reached a point where, almost magical-

ly, a sort of coupling is created: the modes synchronize, and this allows us to be able to achieve much broader and accurate information transfer,” explains Professor Stefan Wabnitz, author of the discovery together with some colleagues from Limoges. Wabnitz is the principal investigator of an H2020 ERC Advanced Grant, called STEMS, which aims at testing these new dynamics in the greatest number of applications. After starting his work at the University of Brescia, he now works within the DIET of La Sapienza: “This type of project allows portability from one university to another - the professor continues - : Brescia remains involved in our work, but I managed to return to Roma, my home city,

where La Sapienza gave me the opportunity to make a truly important step forward in the project.” In fact, the construction of a special laboratory based on a latest-generation laser system, dedicated to STEMS and costing half a million euros, was completed just a few months ago. “Now I have a large and enthusiastic staff, as well as first-rate equipment. In the coming years, given that the project has come only half way, our goal will be to employ multimode fibres in several application areas: by way of example, in a recent proof of concept we are using them in the endoscopic sector, and we have obtained excellent results. But I believe that interesting perspectives also exist from the industrial point of view: we only need have them considered by interlocutors who are often not used to trusting university research...” ■



FROM LEFT, STEFAN WABNITZ, MARIO ZITELLI, FRANCESCO RINALDO TALENTI AND FABIO MANGINI