Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
2020 will be an unforgettable year for humanity. For the worse, the coronavirus COVID-19 pandemic disease has caused hundreds of thousands of deaths around the world, with widespread economic and social repercussions. For the better, we realized how fast our planet can begin to restore itself without incessant pressure from human activities on the land, air and water.

“The future of our civilization goes hand-in-hand with the success in developing cost-effective smart materials to help human technology to perform better at all levels.” [1] So began the editorial of the Dyes and Pigments Special Issue dedicated to the third edition of the IC3EM 2018 [1]. Just two years later, the importance of Science for our society and survival has become so clear, for our own lives and for our planet.

Never since the crisis of the Second World War has the world paid so much attention to the science and the research done in laboratories. Findings on new antiviral drugs, the performance of more reliable and efficient diagnostic tests, the development of smart protective materials, and finally the research done on a new effective vaccine have been and continue to be critical at the forefront of our response to the pandemic.

Lights and colours used as analytical tools have shown their essential worth during this pandemic. Lights and colours implies rapid detection devices, quick diagnostic tests, cheap biomedical devices, and most importantly, sheer numbers with the massive increase in public health surveillance. During this period, the citizens of the world have become aware of dozens of biochemical diagnostic tests used to detect COVID-19 and its effects on the human body. Many of them were created or modified in international laboratories right up to the last minute before deployment. Scientists in general, but more specifically virologists, immunologists, geneticists, biologists, physicians, physicists, mechanical engineers, and chemists appear constantly in the news explaining or reviewing these advances. Some of these tests are based on various biochemical reactions, like the reverse transcription polymerase chain reaction (RT-PCR), the most efficient test for COVID 19, loop-mediated isothermal amplification (LAMP), a simpler but lesser known test, or even the enzyme-linked immunosorbent assay, known commonly as ELISA. Many of these methodologies depend on emissive dyes, such as rhodamine, or magnesium pyrophosphate or similar visibly detectable compounds [2]. The accuracy of the diagnosis results could be enhanced by using different fluorescent dyes or even colorimetric dyes in the reaction mixture.

The IC3EM series is already a well-established international scientific event in the field of colorimetric and emissive materials, being an international forum to discuss all topics from fundamental research in color development and emissive materials to different applications across diverse research fields, including sciences dedicated to health and wellbeing. Hot Fields indeed correspond well with these COVID-19 times.

The fourth edition of this wonderful conference was scheduled initially for June 2020, to coincide with Lisbon’s festival of St Anthony, a week full of attractive traditional and social events. However due to the COVID-19 pandemic, the conference had to be postponed to November.
We nevertheless expect to maintain the high-quality atmosphere of discussion and exchange of excellent science as in previous editions (See Fig. 1). The IC3EM2020 will again take place in Costa de Caparica, Portugal as it has done since its inception, keeping together our tradition and scientific endeavour. The gracious presence of Ramón Martínez-Mañez (Spain), Milko Van der Boom (Israel), Mario Nuno Berberan (Portugal), Mark Heron (UK), Tia Keyes (Dublin), Luca Prodi (Italy), Hironori Kaji (Japan), and Alan Balch (USA) as plenary speakers will captivate us through their outstanding contributions in the areas of organic and inorganic chemistry, photochemistry of complexes, emissive switching devices, solar cells, new functional nanomaterials, novel photosensitizers, medicinal chemistry, and agricultural and industrial applications. To make this conference even more appealing, this 2020 edition will be honoured by the presence of outstanding keynote speakers, namely Todd Marder (Germany), Pier Luigi Gentili (Italy), Sylvain Achelle (France), Michal Lahav (Israel), Claudio Rossini (Spain), Jim Thomas (UK), Vitor Freitas (Portugal), Fernando Pina (Portugal), Anatoly Metelitsa (Russia), Sylvia Vignolini (UK), Benoit Champagne (Belgium), and Hui Xu (China). Finally, the picture will be completed by the presence of close to 145 research fellows from the five continents. This promises to be an outstanding and remarkable international event.

The most valuable treasure of this conference, the knowledge shared, is collected in this fourth special virtual issue in the IC3EM series entitled "Lights and Colours: Science, Techniques and Surveillance for the Future: 4th IC3EM 2020 Caparica Portugal." Indeed, this is a unique opportunity to admire the work of the best in the arena. We sincerely thank all our fellows who have contributed to this virtual special issue, especially acknowledging the work produced from your homes under stress during the pandemic. Last but not least, we are thankful to the Editors-in-Chief of Dyes & Pigments Mark Heron and Mark Wainwright and to the Associate Publisher of Dyes & Pigments, Joshua Bayliss, who agreed to publish this virtual special issue dedicated to the Fourth International Caparica Congress on Chromogenic and Emissive Materials, IC3EM2020 edition, allowing us to act as Guest Editors.

Declaration of competing interest

The authors declares any conflict of interest.

Acknowledgments

The chairs of the 4th IC3EM conference Jose Luis Capelo-Martínez and Carlos Lodeiro thank the PROTEOMASS Scientific Society (Portugal) (General Funding Grant) as the main organizer, partners LAQV-REQUIMTE, Green Chemistry Associated Laboratory, NOVA School of Science and Technology, and NOVA University Lisbon, and supporters and sponsors Bruker, Paralab, Labor Spirit, Castelbel, Turismo de Portugal, TAP Air Portugal, Turismo de Lisboa, IATA, Elsevier (Dyes and Pigments journal), Chemosensors MDPI journal, Edinburgh Instruments, Nanoarts, Royal Society of Chemistry (RSC), and the Portuguese Chemical Society (SPQ) for the generous financial and practical support,

References

[1] Lodeiro C, Capelo JL. Dyes Pigments 2018:463-4.
[2] https://www.cenb.net/covid-19/what-tests-could-potentially-be-used-for-the-screening-diagnosis-and-monitoring-of-covid-19-and-what-are-their-advantages-and-disadvantages/ (Last day accessed 4th June 2020).