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Editorial

NICOLAS BONOD
Editor-in-Chief

Sustainability : Lighting the Way with Photonics

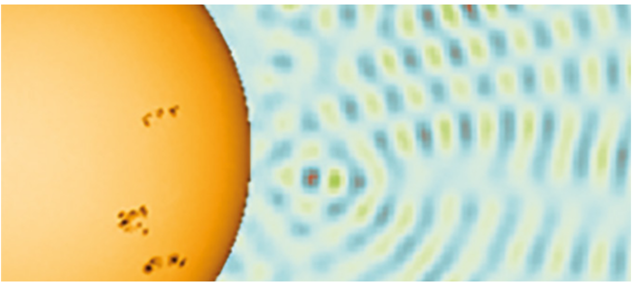
According to the World Meteorological Organization, 2024 is likely to become the warmest year on record with warming temporarily hitting 1.5°C, marking the period from 2015 to 2024 as the warmest decade. The acceleration of ice melting, sea-level rise, and ocean heating is alarming. Despite some reductions in greenhouse gas emissions in a few countries, overall greenhouse gas concentrations continue to rise. Additionally, biodiversity is declining with a significant drop in the aggregate Red List Index. It is clearer than ever that efforts must be intensified and transformations towards sustainable industries accelerated.

Optical processes play a crucial role in global warming through the increased concentration of greenhouse gases, and photonics in turn emerges as a natural technology to address the climate crisis. Light-driven technologies offer numerous solutions in energy production, light harvesting, photocatalysis, energy saving, green manufacturing, environmental monitoring, pollution detection, waste sorting… This impressive list motivated the editorial team of Photoniques to publish an extended issue covering some of the most interesting and relevant aspects of sustainable photonics.

Let's focus on energy, a critical issue since this sector is the largest emitter of greenhouse gases. Photonics technologies can be used to heat or cool buildings through direct solar heating or radiative cooling and to produce electricity through the rapidly advancing field of photovoltaics. The optimization of light trapping and confinement in advanced materials has pushed the concept of passive radiative cooling to daytime passive radiative cooling with impressive results and progress over the last ten years; Advances in photonics and light harvesting continue to enhance the efficiencies and global performances of solar cells, accelerating their worldwide deployment.

A longstanding challenge in producing carbon-free energy has been harnessing nuclear fusion with hydrogen isotopes. While a laser-based approach was proposed and investigated as early as the 1960s, magnetic fusion confinement has since received most of the attention and funding. However, the ignition point achieved by the National Ignition Facility in 2022 evidenced the relevancy of inertial confinement fusion, spurring the formation of industry-academic consortia and the funding of ambitious programs. Although numerous difficulties remain, the goal is now clearly identified: developing carbon-free inertial confinement fusion-based electricity power plants by the mid-century.

The promising horizons offered by photonics to mitigate the climate crisis and promote sustainable technologies can boost the transformation of our industries. Light-based technologies offer innovative and relevant solutions in the quest for a sustainable economy, lighting the way to achieve carbon neutrality and build a bright future.



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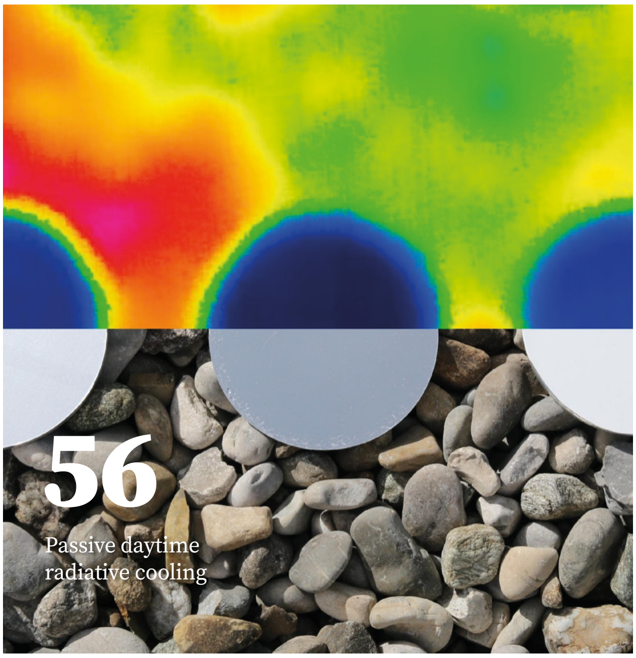

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FRANÇOIS SALIN
President of the French Optical Society

A new academic year full of action and hope!

We left off after OPTIQUE Normandie, whose preparation had drained much of our energy. Fortunately, the summer holidays allowed us to recharge our batteries. We hope you were able to do the same because this new academic year promises to be busy and exciting. But first of all, a warm welcome to Emiliano Descrovi, the new EOS president.
The Wavinaire organized October 2nd with the CNRS GdRs "Ondes" and "Complexe", to delve into the decoherence in quantum optics, was a success. Many thanks to Eliott Beraud (LP2N), Michel Brune (LKB) and David Dreon (planqc), who put the issue into perspectives. One week later, our Optical Calculation Club successfully co-organized the Freeform surfaces – ONERA scientific days.
2024 was a very successful year for the SFO, and we are already actively working on 2025. We contribute to the preparation of the C'Nano Congress in Paris-La Villette (March 18-21). In addition to the usual participation of the Nanophotonics Club, SFO will co-organize the industrial exhibition. Two residential schools are also in the target. The annual one at Les Houches (iconic physics center in the French Alps), May 12 to 23, will be devoted to LNOI. The school organized by the LIDAR Club is back at the Observatoire de Haute Provence (June 11-16).
In parallel, work starts towards the 42th edition of the guided optics Club conference, JNOG, in Sète (July 7-10), for the first time as a residential event, ideally located by the sea. Chairs Christelle Brimont (LCC) and Stéphane Blin (IES), will ensure an excellent hospitality and a top-notch scientific program. Book your spot ASAP...
As for the rest, an important change that we are hopeful for could mark a significant development in SFO trajectory. The request for public utility recognition, submitted 2 years ago, should now be able to come to fruition following our third-year consecutive positive economic balance. Let's hope and keep moving forward!

Ariel Levenson,
Directeur de recherche CNRS, Past-President of SFO
François Salin,
President and CEO Ilasis Laser, President of SFO

EMILIANO DESCROVI
President of the European Optical Society

Lights on Napoli!

The EOS Annual Meeting, held in Napoli this September, offered an amazing opportunity for the European Optics & Photonics community to meet and extend a bit longer the enjoyment of the summer weather.
In the spectacular setting of the Parthenopean city, general chairs Luca de Stefano, president of the Italian Society of Optics and Photonics (SIOF), and Raffaele Velotta, professor at the University of Napoli, supported by Elina Koistinen, Patricia Segonds and myself, offered a rich program across many branches of O&P. Outstanding plenaries covered topics from non-linear optics, biophotonics and optics in complex media. Also, the 50th anniversary of the first work on passive radiative cooling, carried out in Napoli, was celebrated with an inspiring talk. As in EOSAM2023, traditional Topical Meetings were complemented by Focused Sessions, proposing novel exciting themes. Tutorials registered a great attendance from PhD students and early-stage researchers, thanks to the broad thematic coverage offered, from 2D nano-optics to scientific communication.
With 470 accepted submissions, EOSAM2024 gathered nearly 500 attendees from 36 countries (18 outside EU), reaffirming its status as a key appointment on the European scene. The EU session, hosting representatives from the EC, Photonics21, PhotonHUB and the 360Carla project, represented a valuable moment for a lively discussion. Significant appreciation also from the industrial sector, specifically at the IMOTS sessions and the Industrial Podium that preceded the welcome party. As a follow-up, a topical issue on EOSAM2024 is launched on the EOS open-access Journal, JEOS-RP. Extended papers are welcome for submission and will be subjected to peer-review. JEOS is indexed in major databases and EOS members benefit from significant discounts on APCs. Next year, EOSAM will move to Delft, The Netherlands, August 24-28. Save the dates and stay tuned for updates on the newsletter, social media, and Photoniques! Visit https://www.europeanoptics.org/ to discover more on EOS memberships.

Emiliano Descrovi,
Professor at the Politecnico di Torino, President of EOS

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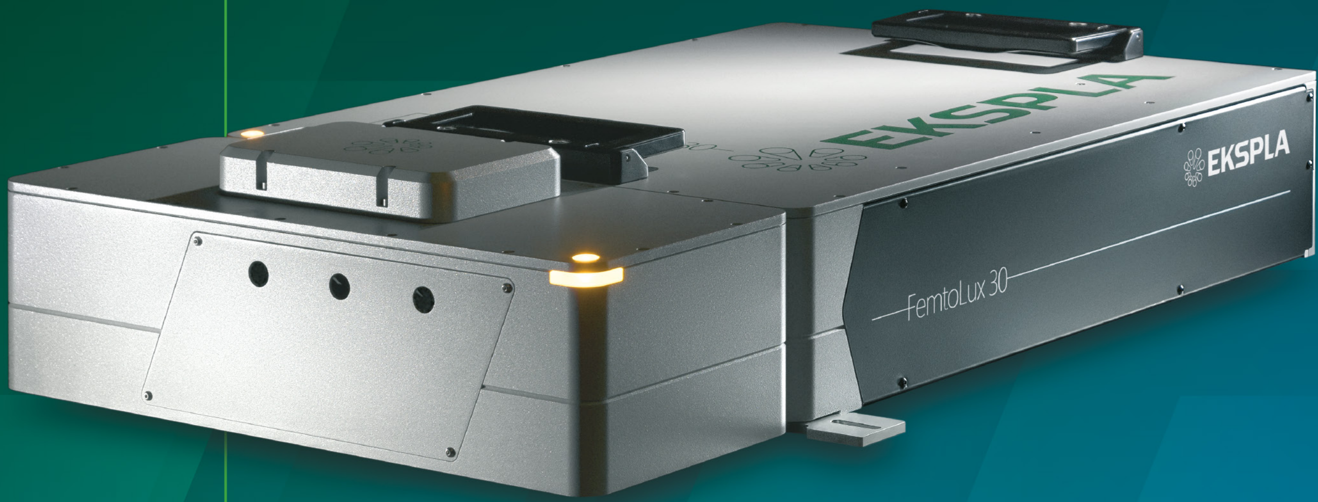

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