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**Exclusive electrically-tunable mectastems for visible light**
The study reports that a dielectric metasurface is capable of electrically tuning the optical properties in the visible spectrum. The device is demonstrated for beam steering and holographic holography.
Andrey Kaldenbach, Longfeng Lin & Magnus P. Jonsson

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**Directional coupler for quantum LDPC cross-correction on square and hexagonal grid architectures**
Experimentally and with quantum circuits, we report the implementation of efficient quantum bit error correction. Using a quantum circuit, we perform a quantum error correction code that can be used to correct for errors in quantum measurements while outperforming the classical bit code.
Yaping Yi, Hanwei Zhang & Jianhua Huang

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**Excited-state mirrored intramolecular charge transfer enables reversible light control of thiadiazine-arylene thiolates**
Photoelectric dyes are preferred to exhibit a excited charge transfer that shapes their excited state. Here, the authors demonstrate a compound system for the efficient way to control the dye's brightness in organic solvents.
Giovanni M. Arzeroumi, Yifu Ma & Dirk Guldi

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**Directional atomic-ordering gradients enable fatigue-resistant superelasticity in carbon-tube network**
Here, the authors report a strategy to overcome fatigue-limiting problems, enabling fatigue-resistant superelastic carbon nanotubes and offering a strategy for designing durable lightweight porous materials.
Yi Liu, Qiyuan Ai & Hongjie Wang

Article
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**Scalable 3D-hybrid heterogeneous photonic computing chiplets**
Integrated photonics promises fast, energy-efficient information processing but remains difficult to scale. Here, the authors demonstrate a hybrid photonic-electronic chip that can be scaled to large arrays using 3D photonic packaging to realize a multi-chiplet system.
Hong Yang, Chao Qian & Xian Min Jin

Article
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**Quantitative prediction model of FB 113 driven self-assembly nanoparticles**
Self-assembly of nanoparticles is an opportunity to improve potential efficiency, but predicting the formation of self-assembled structures remains challenging. Here, the authors report the formation of nanoparticle superlattices in 3D domains that self-assembly of many particles into nanoparticles and that their self-assembly, geometrically and thermodynamically, is controlled by nanoparticle shape.
Yan Zhang, Sara Xu & Yi-Chun Zhang

Article
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**A wearable microfluorescence surface electrode network for gastrointestinal control of hand motor recovery**
Wearable electrodes can be used to monitor and control muscle activity, but they are not yet accessible or electrode surface stimulation system with programmable pulse-wave shape, enabling accurate path mapping and muscle activity monitoring.
Wenlong Zhang, Li Yang & Yong Xu

Article
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**Carbon-neutral algal bloom management via algal-organic matter interweaving**
Algal organic matter (AOM) is repurposed as a crosslinker with metal coagulants, forming gel flocs that enhance algal removal and mitigate membrane fouling. Here, the authors report the mechanism of AOM-mediated flocculation.
Hongyan Zhang, Wenbo Jia & Shuang Zhao

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**Lithium coordination compound reduces neurotoxicity and enhances therapeutic effects in Alzheimer's disease mouse models**
Here authors rationally design a lithium coordination compound (Li-Dp). Compared with conventional lithium salts, Li-Dp has a higher brain uptake and lower toxicity, and can ameliorate cognitive impairment and reduce neuropathology in female AD mouse models. Both the affiliation list of Li-Dp and pathological and neuron cognitive deficits by showing potential for safer lithium-based therapeutics.
Chuanbin Liu, Yang Liu & Jun Tan

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**Achieving ion high-rated and other scale synthesis of nano porphyrene oxide via photochemical defect engineering and oxidative cleavage**
The study provides a possible photochemical and oxidative cleavage method circulating electron-type defect engineering and oxidative cleavage. Here, the authors report a nanoscale fabrication of nanoporous graphene oxide by a two-step method.
Yuanlei Yang, Chen Hou & Qianhua Chen

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**Giant nonlinear optical responses in the visible via lattice-controlled cascade amplification of electron avalanche**
The work extends and amplifies the nonlinear response of Ta$^{3+}$ photon avalanches into the visible spectrum, enabling nonlinear optical responses in the visible spectrum.
Ye Yuan, Zehua Wen & Guoping Dong

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**Low-pressure saturation of all-solid-state batteries enabled by an organic electrode**
Here, the authors report a low-pressure practical solid-state batteries, that the authors demonstrate that the Li-ion battery, using crystalline, using crystalline, that the stability window is superior to several previously and microstructural changes enable stable cell operation at low pressure.
Yuanlei Yang, Chen Hou & Qianhua Chen

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**Chip-scale narrow-linewidth optical parametric oscillators**
Optical parametric oscillators (OPOs) are important sources of coherent light, but their linewidth is usually broad. Here, the authors demonstrate a chip-scale OPO with a linewidth of 1.5 MHz, which is more than a single order MHz or whether four-wave mixing cavity, narrowing linewidth 10 times to 150 kHz, and a threshold power of 1.5 mW.
Yi Liu, Yuanlaiyi Xu & Xinbo Tuniyaz Tuniyaz

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**Catalyst-free thermal dehydrogenb-condensation for precise synthesis of silicon incorporated aryl-thiophenes**
The synthesis of silicon-incorporated polythiophenes typically requires metal catalysts, which draw poor biocompatibility and limit their applications. Here, the authors report a catalyst-free method for the synthesis of silicon-incorporated polythiophenes with high molecular weights and narrow polydispersity.
Jingsheng Li, Sun Yang & Zhenqi Yang

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**A spectral sensitive interweaver for hyperdimensional photonic computing**
Photonic computing has been explored for years, more energy efficient in full-hardware scaling remains challenging. Here, the authors present hyperdimensional photonic computing with a spectral sensitive interweaver for wavelength-parallel modulation.
Yuxi Long Wei, Yuanqi Wang & Xian-Min Jin

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**Promotional phase transition in perovskite heterojunctions via in situ regulated 2D isomorphisms enables stable solar cells**
Efficient and stable wide-bandgap perovskite solar cells are crucial for the development of tandem photovoltaics. Here, the authors report a phase transition strategy to improve the performance and stability of wide-bandgap perovskite solar cells.
Interfaces, Improving efficiency, stability, and module scalability.
Chengli Yan, Guangbiao Zhao & Yuanqing Zhou

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**Programmable synaptic and stochastic regimes in a monolayer SbN phototransistor**
Artificial synapses such as spiking networks, that mimic device support with the operation of the brain. Here, we report that a monolayer SbN transistor enables electrically programmable switching between synaptic and stochastic regimes, enabling both synaptic and stochastic regimes in a single device.
Yu Yu Zhou, Yongkwon Kim & Yuk Wai Hongwah

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**Unidirectional rolling of single-crystal graphene into nanoscrolls**
Rolled-up nanoscrolls of 2D materials are promising for many applications. Here, the authors report the unidirectional rolling of single-crystal graphene into nanoscrolls with controlled chirality and diameter, which enables the deterministic rolling of exotic scale single-crystal graphene films having good growth orientation and quality, and the fabrication of nanoscrolls with tailored chirality.
Zhang Liu, Qiaoling Tang & Lei Wang and Hu

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**3D-MINTED nanoscopy and protein tracking in densely labelled living cells**
3D-MINTED enables single-fluorophore 3D tracking with precision down to ~1 nm. Here, the authors demonstrate 3D-MINTED tracking of single proteins in densely labelled living cells with a lateral precision of ~1 nm and a localization density of single labelling density.
Jonas Ries, Jonathan Bewersdorf & Stefan W. Hell

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**Fluoritization-driven e- bonding design enables practical aqueous zinc-vanadium oxide batteries**
Amorphous vanadium oxides can store zinc rapidly but often suffer from structural instability in aqueous electrolytes. Here, the authors report a fluoritization-driven strategy that guarantees environment while preserving the reversible, enabling durable aqueous zinc batteries.
Huishiki Song, Yang Hong Cui & Hui Ping Yang

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**Non-Hermitian synthetic phase shifter with topologically protected phase control via tunable losses**
Non-Hermitian systems can exhibit exceptional points (EPs) that enable novel functions for wave control. Working in optical cavity systems, here the authors report a phase shifter that is tunable using optical loss modulation to achieve full cycle phase control protected by topological EP.
Yihao Zhang, Guanhao Peterson & Muhammad Ali Miri

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**Mesoscopic-induced rectification in coordination polymers via allothatic chain dynamics**
Nanostructured polymer gels often can be readily and processability but are hindered by poor mechanical properties. Here, the authors report a strategy to enhance the mechanical properties of magnesium-based frameworks, enabling glass fracturation without melting while preserving network integrity, and enabling processability.
Mingyuan Bao, Hao-Yue Wang & Wei-Min Wang

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**Intramolecular electrophilic aminations of indoles enable divergent bond interpretions to access oligocyclohexanes and 2-carbolines**
Intramolecular electrophilic aminations of aryloindoles (2-arylindoles) are presented which enable the synthesis of 2-arylindoles (compounds related to tetrahydro-2-carbolines) and 2-carbolines. The reaction is promoted by a Pd-catalyzed C-H activation of 2-arylindoles, with the pyrroloindoline and 2-carboline, with the pyrroloindoline and 2-carboline.
Manuel A. Ortuño, Nikolay N. Tereshchenko & Ramón Gómez Arrayás

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**LUNOF: An LLM Multi-Agent for Literature Validated Metal Organic Frameworks Database Correction and Extension**
Metal-organic frameworks (MOFs) are crystalline materials with high porosity and surface area. Here, the authors report that multi-AI reviews and validates publications to repair errors, yielding 100,757 MOF structures.
Hongchao Ma, Yunxuan Wan & Jiaxi Hu

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**3D printed biomimetic high-entropy alloys with dynamic protection for orthopedic damage resistance**
Here, the authors report a biomimetic high-entropy alloy (HEA) with dynamic protection for orthopedic damage. The additive properties a nanostructured bone-shaped protection concept to achieve this, demonstrating the concept in 3D-printed biomimetic HEA implants.
Dongsheng Yang, Yi Chen & Jie Liu

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**Quasi-degenerate carbon occupation enables oxygen vacancy defect healing in nonlinear optical crystals**
A quasi-degenerate carbon occupation strategy offers a pathway to overcome charge-related defects in nonlinear optical crystals, enabling the fabrication of high-performance deep-UV nonlinear optical devices.
Junling Yang, Yin Liang & Xingxi Zhang

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**Photocatalytic control of diamond color center charge states via laser-induced surface oxidation**
Controlling the charge states of diamond defects is important for quantum technologies. Here, the authors report a laser-induced surface oxidation to locally and controllably tune defect charge states in diamond nanofilms.
Mingchen Li, Jiali Yi & Takeshi Ohshima

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**Rhizome-bio-platform for precisible management balancing field efficacy with postharvest residue via dynamic adhesion switch**
Biomass-based platforms for pesticide management balancing field efficacy with postharvest residue via dynamic adhesion switch. Here, the authors report a rhizome-inspired platform that enables dynamic adhesion switching between wet and dry conditions, balancing field efficacy with postharvest residue.
Yifu Zhang, Chunqing Zhao & Hongbo Du

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**Electrically induced phase transition of polyelectrolyte complexes enables tunable ionic diodes**
Polyelectrolyte complexes (PECs) are promising materials for ion-selective membranes. Here, the authors demonstrate an electrically induced phase transition in a polyelectrolyte complex, established ionic diodes with tunable rectification ratios and switching times by the interplanar and superpolarity principle.
Chaoqi Hao, Chen Yuan-Kun & Yanfang Sun Wei

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**Dextrinopamative glycosylations of glycosyl sulfonodihydrides**
Organic crystals are prone to the development of several different glycosyl sulfonodihydrides. Here, the authors report a strategy for the synthesis of glycosyl sulfonodihydrides, which can be challenges. Here the authors report a nickel-catalyzed stereoselective dextrinopamative glycosylation of glycosyl sulfonodihydrides and a wide variety of glycosides in 80 and homologs.
Shuai Zhao, Guo-Yuan Shi & Ping Zhu

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**Chronically stable, frequency-selective auditory brainstem stimulation via ultra-flexible penetrating electrode arrays**
Surface-auditory brainstem implants have poor spatial resolution and limited hearing outcomes. Here, the authors report a penetrating auditory brainstem implant that enables frequency-selective stimulation with low chronic activation and can improve hearing capacity in experimental auditory models.
Jinyi Pan, Bob Liu & Xiao Yao

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**Accelerating high-throughput catalyst screening by direct generation of equilibrium adsorption structures**
The authors develop DFAds, a generative model trained without energy or force labels to produce near-equilibrium adsorption structures, enabling faster screening of catalytic surfaces.
Hongyi Chen & Xiao-Ming Cao

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**Mapping temperature using transmission Kikuchi diffraction**
Mapping the thermal expansion of crystals is important for understanding their behavior and for materials selection. Here, authors develop Kikuchi diffraction thermometry, a non-contact electron microscopy technique that measures thermal expansion from Kikuchi band diffraction patterns.
Tianyue Chen, Xin Liang & Matthew Nowell Kacy

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**Shape-conforming lumen hydrogel for preventing anastomotic leaks**
Anastomotic leaks remain a major complication of gastrointestinal surgery. Here, the authors report a shape-conforming hydrogel that can be delivered through a standard endoscope and forms a protective, drawing component of an adhesive porous layer mechanically interlocked with a non-adhesive backing. The hydrogel maintains mechanical integrity under physiological conditions, prevents adhesions and promotes epithelial regeneration, enabling strategy for leak prevention and repair.
Dongjin Jung, Chao Chun & Xinlong Ding

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**3-D/Entry-chain molecular tuning machines with switchable fluorescence outputs**
Molecular machines can be used to create stimuli-responsive materials, loading and setting information on molecular layers with high output modes due to the challenge in designing molecular machines that can be switched between multiple fluorescence states. Here, the authors report a [3]rotaxane chain molecular tuning machines that connect mechanical motions into fluorescence signals.
Wei-Yan Li, Cheng Lu & Wei-Zheng Yang

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**Localized strain engineered Pt electrode probes in 2D MoS$_2$ devices with tomographic memory and high-mobility transistor functionalities**
Strain engineering can be used to tune the properties of 2D materials, but it is challenging to apply strain to perform the modification of multifunctional strained 2D MoS$_2$ devices in precision. Here, the authors demonstrate a high-mobility transistor functionalities depending on the current transport.
Jiaxing Bunny, Donald Heim & Seunghyun Cha

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**A highly distorted borononium cation**
In contrast to the well-explored protonated homocations of boranes, its alkenyl-dilution remains underdeveloped. Here, the authors report the synthesis and characterization of the first boronium cation.
Yuan-Ming Chen, Jianfei Cheng & Yaping Feng

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**Entropy-engineered polar heterojunction enables near-decoupled polarization–strain behavior for high-density storage**
Strong polarization-strain coupling limits the energy density and efficiency of lead-free dielectric capacitors. Here, the authors report a polar heterojunction strategy that temporarily weakens this coupling, enabling ultrahigh energy storage with minimal dissipation.
Yufei Yang, Jiaxiang Zhang & Li He

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**Dose-selective gallium oxide graphene photodiodes reaching an blender response derived gain bandwidth-record of UV-12Hz**
Solar-blind photodetectors are crucial for missile plume detection and communication but face a trade-off between responsivity and speed. A metal-semiconductor-metal avalanche device achieving ultrahigh gain-bandwidth product.
Chunhong Zeng, Kewei Liu & Dong-Xiu Zhao

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**Visible-light achromatic bright extreme-ultraviolet high harmonics**
Here, the authors report a bright, achromatic extreme-ultraviolet (XUV) light-source that delivers the remaining high photon flux of an wavelength-tunable, achromatic XUV pulses. The authors demonstrate visible light driven XUV with exceptionally high flux at 100 eV, enabled by plasma nonlinearity and the generation of a single attosecond pulse.
Amanda Wilson, Dmitry Zimin & Ian Gilmore

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**Chemical sawtoling of mixed polyolefins via rapid C–H activation**
Polyolefins are the most widely produced plastics, but it is difficult to recycle them into value-added products. Here, the authors report a chemical sawtoling strategy that converts mixed polyolefins into functionalized polyolefins with high selectivity and functionalization degree, forming functionalized polyolefins for polar materials applications.
Yifeng Chen, Yue Yang & Zhengbing Qi

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**Optical observation of ultrafast carrier separation in InGaN photocatalyst nanostructures**
The authors show that ultrafast carrier separation causes the rapid photoluminescence decay in InGaN photocatalyst nanostructures. Their findings are important for the development of efficient photocatalysts for water splitting.
Yihan Zhao, Sang Soon & Tsunenori K. Nishi

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**Wafer-scale transferable hexagonal boron nitride membranes via interfacial engineering for multilevel storage**
Hexagonal boron nitride (h-BN) has shown promising results for the realization of memristive devices, but its wafer-scale integration remains challenging. Here, the authors report a wafer-scale transfer of h-BN via an exfoliation strategy, by controlling negative substrate-exfoliation to grow wafer-scale h-BN monolayers and fabricate high-performance memristive devices.
Shenghan Zhou, Xin Liu & Yongai Zhang

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**Pathway-dependent chiral toroid self-assembly and translocal transformations based on large π-conjugated dipeptides**
Natural nanomaterials of large π-conjugated molecules is a powerful tool for the development of optoelectronic and functional applications. Here the authors demonstrate a series of dipeptides with large π-conjugated molecules that self-assemble into chiral toroidal nanostructures.
Zhiyuan Wang, Wenxu Liu & Pengyao Xing

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**Wafer-scale thin-film PZT phononic integrated circuits enabling multi-terabit optical transmission**
Researchers establish an A-axis thin-film PZT phononic integrated circuits platform through a stable, low-loss waveguide platform and demonstrate a 1 Tbps wavelength division multiplexed optical transmission system.
Zehao Guan, Yuyan Qin & Yang Li

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**Twist-engineered arbitrary polarization detection for intelligent polarimetric sensing**
Twist photonics can tailor light-matter interactions but is difficult to integrate into polarizers. Here, the authors show a twist-assisted polarimetric photodetector that enables arbitrary polarization detection and intelligent polarimetric sensing without complex components in visual computing.
Hongzhe Zhu, Yan Xie & Jing Zhou

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**Nanofriction-strengthened mechanically adaptive electrolytes for safe lithium-metal batteries**
Lithium-metal batteries are promising for high-energy-density storage. Here, the authors report a nanofriction-strengthened mechanically adaptive electrolyte that enables dendrite-free lithium deposition and prevents short circuits and suppresses thermal runaway.
Yanzhi Zhang, Guanhong Wei & Yan Li

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**Hierarchically microfibers-actuated proprioceptive artificial muscles**
Integrating sensors for artificial muscles is promising for soft robotics. Here, the authors report a hierarchical microfibers-actuated proprioceptive artificial muscles, enabling closed-loop control and multimodal sensing.
Yuanyuan Shang, Yanhong Wang & Yanhao Yu

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**Laser ablation rapid evaporative ionization mass spectrometry imaging with live microsensor sampling probe**
Ambient mass spectrometry imaging techniques are powerful tools for the analysis of biological organs and tissues. Here, authors develop a gentle in-line laser ablation rapid evaporative ionization mass spectrometry imaging method that enables live cell and tissue analysis and clinical tissue on open air.
Yu Zhang, Yanyan Li, Xiaolin Ai, Kelvin P. Zhang

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**High-κ bismuth-molybdate single-crystalline dielectrics for high-temperature two-dimensional transistors**
High temperature stability is an important requirement for future electronic circuits based on 2D semiconductors. Here, the authors report single-crystalline Bi$_2$MoO$_6$ dielectrics that enable 2D transistors and logic circuits to operate at temperatures as high as 150 °C.
Tianyu Zhao, Dan Tang & Hua Xu

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