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Layer number survey: dependent abnormal magnetic ordering in few-layer $CrCl_3$ via a $3N_0$ advantage
Ferromagnetic materials are promising candidates for next-generation magnetic memory technologies. In Cr_2X_3 (X=Cl, Br) exhibit through identical magnetic multilayers ($1 \le n \le 10$) — by Kun Ba, Yuanyuan Jiang, Jiaqi Tian, Yuanyuan Liao, Guangyu Xu, Wenxiang Jiang, Xiaoyang Shen, Fei Sun, Wenxiang Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Automated synthesis of bulk-quantum dots with improved batch-to-batch reproducibility via kinetically-mediated co-reduction
Quantum dots which size and heavy metal-free (II-based) materials, but their synthesis is hard to automate and, thus, the spiller can be prevented. Automated synthesis method is described to improve batch-to-batch reproducibility — by Jiaqi Tian, Yuanyuan Liao, Guangyu Xu, Wenxiang Jiang, Xiaoyang Shen, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Intermolecular interactions optimization in weakly solvating ether solvents for wide-temperature Na-metal batteries
Intermolecular interactions optimization in weakly solvating ether solvents for wide-temperature Na-metal batteries
Ether solvents have been widely used in sodium-metal batteries (SMBs) due to their strong weak solvation ability and high stability against sodium metal. However, the low boiling point limits their wide temperature application. Here, by highlighting the key role of intermolecular interactions in wide temperature reversibility, — by Yuanyuan Liao, Kun Ba & Yan Shi

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Grain boundary-engineered aluminum current collector for energy-dense initially anode-free sodium metal batteries
The initial anode-free sodium metal cells advantages in energy density and cost, safety, and ease of manufacturing. However, the poor reversibility of Na metal anodes (NMAs) on Al current collectors (CCs) is considered to compromise the two. Additive Na-alloying Mg-engineering, and defect-reversible batteries. — by Xiaoyang Shen, Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Nanofluidic flow of viscous electrons Hall-induced by solar concentrations in mine contacts
Nanofluidic flow of viscous electrons Hall-induced by solar concentrations in mine contacts
Nanofluidic transport of viscous electrons Hall-induced by solar concentrations in mine contacts. Electrons are viewed as viscous rather than as particles. Here, the authors provide evidence of superfluidic electron flow under microscale in platinum in pure graphene. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Bioinspired nano architecture for cellulose fibers with spider silk, like toughness
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Revealing hidden periodicity in monoterpane-encoded metamerfacts
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Here, the authors report the observation of flat bands on a nontopological surface lattice of ferromagnetic LaS_2 single crystals by angle-resolved photoemission spectroscopy (ARPES). — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Dihydroxon-bonding interactions in ether-based electrolytes to enable high-voltage lithium-metal batteries
Ether-based electrolytes typically exhibit poor high-voltage stability. Here, the authors control a dihydroxon-bonding interaction in ether-based electrolytes to enable high-voltage lithium-metal batteries with stability. of the ether-based electrolyte without considerably reducing its bulk solvation structure. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Towards practical aqueous zinc-metal pouch cell batteries via metal's bound water-mediated shear-thickening electrolyte
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Mechanically tunable intra-g to-ß-phase transition and stabilizing a-phase FAPbI$_3$ via regulating ß-phase orientation
Mechanically tunable intra-g to-ß-phase transition and stabilizing a-phase $FAPbI_3$ via regulating ß-phase orientation. Here, the authors report a mechanically tunable intra-g to-ß-phase transition and stabilization of a-phase $FAPbI_3$ via regulating ß-phase orientation. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Indium-Based Octahedra-g Coordinating PN- I Termini for Stable Perovskites
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A nanoscale fibrobus transformer from DNA
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Atomically precise catalysis design toward efficient water-splitting hydroxyapatite
Hydroxyapatite (HAP) is widely used in biomedicine, as safety, and materials, but catalyst optimization is rare. Inspired by the structure of HAP, here, the authors report a precise catalysis design and release environmental and economic evaluation for practical catalyst development. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Precision timekeeping with atomic clocks: evolution and future directions
Here we review the evolution of timekeeping, focusing on atomic clocks and time dissemination. Applications of precision timekeeping have contributed to many scientific discoveries and underpin emerging applications such as quantum communication, while addressing future directions in global navigation satellite systems (GNSS). — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Thermoelectric Detection of Crossed Andreev Reflections in Quantum-Hall-Superconductor Hybrid Structures
The authors interface the quantum Hall edge modes of CrI_3 flow with a thin superconducting film. Using thermoelectric measurements, they observe signatures of crossed Andreev reflection and the absence of local Andreev reflections. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Oxygen vacancy-based cleavage enables efficient photocatalytic H_2O_2 production via an O_2 dissociation pathway
The authors report a dual-site photocatalyst for efficient H_2O_2 production. Oxygen vacancies on Bi_2WO_6 nanosheets promote O_2 dissociation and enable a two-step reaction pathway for sustainable chemical synthesis. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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U-in-3 composite foil with built-in electric fields to stabilize Li-Li_3P_4/Interface for long-life all-solid-state batteries
Lithium-based all-solid-state lithium batteries (ASSLBs) suffer from poor interfacial compatibility and instability. Here, authors propose an anti-3 doping into a ceramic to stabilize the Li-Li$_3$P$_4$ interface and enable long-life all-solid-state lithium batteries. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Precise alkylene asymmetrical control of complex metal clusters at the nanoscale is challenging. Here, authors report a chiral at carbon-C$_4$C$_4$C$_4$C$_4$ network with near infrared photoluminescence by making alkylene heterocyclic to highly symmetric C symmetry hexagonal. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Conversion-driven heterointerface reconfiguration enables fast and durable aqueous zinc-sulfide-type-based positive electrodes for aqueous batteries
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Activating lattice oxygen in metal oxyhydroxides as durable electrodes for industrial-scale seawater splitting
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Acute isomer communication electronic textile for spatiotemporally and ultraprecise object search
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Ozone-controlled ozone defect optimization in solution-processed WO_3 thin films for high-efficiency optical modulation
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Multimodal deep learning optimization of chiroptical spectroscopy for discovering point-group molecular families and inverse design transfer to organic chiral luminophores
Manual optimization of materials with circularly polarized luminescence is time-consuming and often limited by human intuition. Here, authors report a multimodal deep learning framework that combines spectroscopic data with chemical structures and predicts the apparent in an organic system. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Precipitated Fermi pockets and robust electron pairing in helvity-doped CaO_3 planes of cuprate superconductors
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Closed-loop high-precision two-photon lithography based on a multitrained single-cavity dual-combiner
Two-photon lithography enables the fabrication of complex 3D microstructures, but its precision is limited by material shrinkage and process variations. Here, authors develop a closed-loop system that improves the reproducibility for large-scale continuous manufacturing. — by Yuanyuan Liao, Kun Ba, Yuanyuan Jiang, Jianxin Ding, Jiabao Sun & Yan Shi

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Unidirectional cellulose nanocrystal-hydrogel for bio-based invertible chiral optics and sensors
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Diffusional ageing at water/oil interfaces laden with charged nanoparticles studied by single-molecule tracking
The dynamics of charged nanoparticles at water-oil interfaces, crucial for a broad range of phenomena, from emulsion stability to biological processes, remain poorly understood. Here, the authors report single-molecule tracking, revealing anomalous diffusion dynamics and aggregate growth mechanisms.
Yuzhou Zhao, Hongjun Chen & Yuanyuan Wang

Article
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An efficient mid-infrared computational spectrometer based on reservoir-engineered 2D-perovskite coupled chromatic crystal nanocavities
The thin, tiny, ultrawide high-resolution, fast reconstruction, providing a scalable and efficient platform for compact spectroscopy.
Jiaming Yin, Haibo Jiang & Yi Gao

Article
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Resource state quantum RAM for fast and error correctable queries
The authors demonstrate how an efficient quantum RAM can be built from a destructive-measure bias, resource state quantum RAM, which can be used to perform fast and error correctable queries, and robust and error correctable queries, with feasible neutral atom implementations.
Yunchao Liang, Dominic Berry & Jonathan Wang

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Two-dimensional melt-growth of large-scale, single-crystalline hybrid organic–inorganic perovskite films
Researchers have developed a two-dimensional melt-growth method to produce large-area, ultrathin hybrid perovskite films with precise control of substrate-type, thereby enabling the scalable fabrication of reliable flexible electronic devices.
Tuanyuan Jin, Gang Wang & Xie Jiang

Article
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Microbial nanomotility: driven by extracellular electrons generated from mechanical forces via flexoelectricity
Here, the authors report a mechanism for microbial nanomotility, which they name flexotaxis. By driving a nanoampere flow, the authors reveal that flexoelectric-induced electrons fuel bacteria, enabling them to move directionally. This finding links electricity with cell energy source for growth independent of sunlight or chemical substrates.
Yue Lei, Xiaojian Wang & Mengqiu Zhou

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Engineering nucleotide-functionalized galectin cells for attacking the bone marrow axis in post-arthritis therapy
Here, the authors report a nucleotide-functionalized galectin cell engineering platform, which relies after focusing on cardio-activation, gain relief, in anti-inflammatory effects alone. Here, authors develop a nucleotide-functionalized galectin platform with an anti-inflammatory therapeutic strategy in the treatment of post-arthritis.
Jie Liu, Yuan Yang & Liang Zheng

Article
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Ice adhesion-enhanced nanozyme
Here, the authors report an ice-adhesion-enhanced nanozyme method to overcome poor performance and ice-water phase transition, which can achieve reproduction and assembly of particles on the interface with enhanced performance.
Jiaming Zhou, Chunqing Wang & Yongsheng Chen

Article
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Turbulence drives seabed modification by offshore windfarms
This study investigates the influence of turbine foundations on the seabed under windfarms. It finds that at low a larger impact than previously thought. The results show that less sheet erosion than
Christopher R. Vogel, Jeffrey A. Nittrouer, Yuan Gao & Andrew J. Kirby

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Sparse MRC-x-text for artificial sparse-intelligence based explainable medical diagnosis, resource prediction and problem complexity
Here the authors propose a hyper-sparse, algorithmic, computational benchmark to assess frontier artificial intelligence models' ability to reason over sparse, high-dimensional medical records. The hyper-sparse scenario establishes that explainable AI models can perform complex, multi-step, quantitative operations on patients, underscoring the need for symbolic components.
Ahmed Alaa Ghazal, Yuyan Wang & Jingrui Weng

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Berry curvature-enabled photodissociation of $FeCO_5$ observed by ultrafast electron diffraction
Ultrafast gas-phase electron diffraction of $Fe(CO)_5$ reveals a 200 fs dissociation to $Fe(CO)_4$ and CO, with a suggested predominant loss of axial ligands. Here ultrafast electron diffraction experiments, supported by theory, reveal that Berry curvature governs the dissociation.
Haosen Hou, Yinbo Li, Xiaolei Liu & Jie Yang

Article
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Network completeness enables precision-scale transport pathways in multi-layer membranes
Here, the authors report a network completeness framework that quantifies how the architectural network completeness as a key descriptor to guide the design of contaminant-resistant membranes. The framework integrates graph theory with transport modeling and experimental validation. The authors present an optimized balance of molecular selectivity and contaminant resistance.
Hongyu Gao, Xiaoyuan Chen & Tae-Hyun Bae

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Quantum logic operations and algorithms in a single 25-level atomic qudit
Here, the authors report a qudit in a quantum system in a single quantum system or qudit. The authors examine the qudit's quantum dimensionality and demonstrate multi-level quantum logic, suggesting a promising route to efficient quantum processing.
Mu-Kang Liao, Yanhong Li, Z. Lin & Li-Yuan Hung

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Customizing structural orders frustrate crystallization in a metallic glass
Overcoming the glass-crystal frontier crystallization in a metallic glass, producing an all-amorphous metallic glass-based nanowire. Here conventional crystallization at high heating rates to a polymorphic crystal structure is suppressed.
Wei Zhang, Yuguo Li & Jianbing Zeng

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Tailoring polymers of intrinsic microporosity as photoredox catalysts for continuous-flow reaction–separation processes
The authors report chirality-designed polymers of intrinsic microporosity as heterogeneous photocatalysts for continuous-flow reaction–separation processes.
Hanlin Liang, Xiangyi Qiu & Qiang Zhang

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Dual superbrooch photomastering unlocks spatially programmable heterojunctions in bound crystal diamonds
Here, the authors report a dual superbrooch photomastering method that enables spatially programmable heterojunctions in bound crystal diamonds, which can be achieved by photopatterning method to tune mechanical properties and thermal conductivity.
Yuyuan Wang, Yuguang Chen & Jian Li

Article
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Direct solar energy charging of metal–air batteries enabled by photo-coupled electrodes
Rechargeable metal–air batteries require high overpotentials. Here, authors report that light can directly drive the charging reaction in metal–air batteries, enabling solar energy to be stored in chemical bonds rather than heat-free charging voltage and make metal–photo-coupled rechargeable batteries.
Jiaming Yu, Yi Wang & Jiaming Li

Article
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Probing contact electrification processes from interfacial charge transfer to bulk transport in amorphous polymers
Contact electrification is a phenomenon that provides mechanical-driven power generation, key process in contact electrification, from interfacial charge transfer to bulk transport in amorphous polymers.
Kai Cheng, Yaoxiang Ye & Zhong Lin Wang

Article
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Ionic liquid as a structure-directing agent for Frank-Kasper phase formation in block copolymers
Achieving Frank-Kasper phases in block copolymers is challenging. Here, we report that ionic liquid can direct the formation of Frank-Kasper phases by enhancing the interfacial curvature of assembly to give control over micelle packing to obtain range of phases and transitions.
Aditya Sahoo, Sumana Kondapalli & Yuan-Lung Chen

Article
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Revealing buried ferroelectric topologies by depth-resolved electron diffraction imaging
Here, the authors report a depth-resolved electron diffraction imaging method to reveal buried ferroelectric topologies. The authors achieve a depth resolution of pure domains and three-dimensional reconstruction of ferroelectric topologies in a thin film of lead titanate.
Yang Yao-Hua Liu, Kaushik Agarwal & Yu-Tsun Shao

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Synergistic mixed electrocatalysis enables green and efficient synthesis of urea monomer sodium acid
The electrochemical synthesis of urea monomer acid and is limited by the activity selectivity stability of electrocatalysts. Here, we report a mixed electrocatalysis strategy that enables green and efficient electrosynthesis of urea monomer acid in a system with carbon dioxide & nitrate conversion.
Jiangtao Cao, Chunqing Wang & Yanfang Wu

Article
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Observation of electromagnetic ideal Bodin-Immediance-governed superconvention in complex near-zero-index networks
In this study, shows that electromagnetic energy in near-zero-index complex networks forms a quasi-ideal Bodin-Immediance-governed superconvention, enabling lossless conditions such as 'potential differences' and a bound charge on a stable radius and an 'impedance'.
Shenzi Yan, Haifeng Li & Yue Li

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Adsorption based on excitation
This study identifies excitation-mode adsorption on metallic/half-polar/semi-crystal graphene oxide surfaces, which can be achieved by photoexcitation of charge transfer in excited charge transfer, and the authors report a photoexcitation strategy to enhance adsorption.
Jie Chen Gu, Yan Yan Guo & Ji-Ming Yuan

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Generative modelling of inorganic materials with explicit electronic structure
The work introduces DiffusionDFT, an electronic-structure-aware generative framework that incorporates electronic density of states (DOS) into diffusion-based crystal generation. DiffusionDFT demonstrates enhanced performance and accurate inverse design capabilities.
Junfei Park, Junyoung Choi & Hyoung Jung

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Revisiting Zn-specific nucleation via a dimensionless factor to quantify interfacial electrochemistry of aqueous batteries
Here, the authors report a dimensionless factor to quantify anisotropic Zn deposition, enabling universal metric to describe nucleation in aqueous batteries. Here, authors report a universal descriptor that quantifies anisotropic Zn deposition, enabling a unified metric to design an advanced electrolyte.
Zhou Zhang, Xiaoning Zhang & Chengdong Zhao

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Room-temperature multiscalar metastability in a moiré superstructure
Here, the authors report a moiré, such as charge-density-wave, could serve as a building block for electronic metastability. Here, using a class of engineered, photoexcited, and controlled measurements by, Sc, Ga, and countless, demonstrate the existence of electrically driven non-volatile metastable states in the bulk of a moiré superstructure.
Xiaoyu Li, Yifan Su & Yan Zhang

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An intelligent feedback loop for sustaining self-lubrication and wear resistance
Here, the authors report a tribology-driven feedback loop for sustaining self-lubrication and wear resistance. The authors introduce a tribology-driven feedback loop that maintains low-friction, high-wear-resistance, self-lubrication, and self-repairing.
Yuhang Yang, Qilin Zhang & Ji Ji

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Continuous wave organic laser enabled by monodisperse molecular crystal
Continuous-wave (CW) organic lasers remain challenging due to triplet accumulation and thermal quenching. Here, we report a monodisperse molecular crystal that enables CW lasing by suppressing triplet excited molecule to excessive thermal effects, enabling CW organic lasing at room temperature.
Lan Zhang, Xiaoqing Zhou & Wei Du

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Charge-conducted cellulose nanofibril binders for PTAS-free, high-loading lithium battery positive electrodes
Here, the authors report a cellulose binder that enables high-loading, high-capacity, and performance. Here, authors develop a cellulose nanofibril binder that enables high-loading, high-capacity cathodes. Here, authors report a cellulose nanofibril binder that enables high-loading, high-capacity cathodes.
Sang-Hee Ahn, Hyo-Young Kim & Sang-Young Lee

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Automatic selection of the best neural architecture for time series forecasting
Selecting the best neural architecture for time series forecasting remains challenging. Here, the authors present an automatic selection framework that integrates meta-learning, neural architecture search, and model optimization, identifying flexible optimal designs and reducing human and while highlighting new opportunities for automation.
Xiaoning Cao, Shaoqing Liu & Yanyuan Xu-Hamilton

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Three-dimensional printing of multilayer stretchable electronics with buckling-interconnect structures
Multilayer stretchable electronics have difficulty achieving reliable 3D interconnections with optimal electrical performance and mechanical stretchability. Here, we report a buckling-interconnect strategy that enables reliable 3D interconnections and multilayer stretchable electronics.
Yuanhao Chen, Yuanyuan Wang & Yan Guan

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Temporal super-cell engineering and acoustic amplification in dissective phononic time crystals
Floquet time crystals allow exotic wave control through incommensurate temporal gaps in space. Here, authors report a temporal super-cell engineering method that enables acoustic amplification. Here, authors build phononic time crystals using discrete resonant metasurfaces as a temporal Floquet system.
Weiqiang Liu, Jingchang Zhu & Yuxiang Jian Hao

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Synergistic antenna modulator interaction for a monolithic electronic RF receiver
Here, the authors report a monolithic receiver (RF) antenna and mixing architecture is demonstrated with a record high conversion efficiency (CE-RF) for compact footprint, enabling communication, sensing and imaging in a single chip.
Changjin Lee, Tianyan Yin & Jiaming Yin

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National-level assessment of infrastructure-coupled roadside solar energy toward transportation decarbonization in China
This study quantifies infrastructure-coupled roadside solar potential across mainland China by linking high-resolution solar resource data with road network characteristics and land-use constraints, and provides spatially explicit insights into the energy
Jianyuan Chen, Jianshan Wang & Yan Huang

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Machine learning-assisted self-powered ear tag for animal welfare
Authors combine biodirected and solar energy to fabricate battery-free wearable ear tags that enable real-time monitoring of animal welfare. Here, authors report a self-powered ear tag that enables real-time wearable biosensors. The system achieves over 90% accuracy in identifying up to 5 metabolic states.
Jiaqing Xu, Peng Wan & Yuxing Yan

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Terahertz ionic kinetic-gating for producing high-concentration and shelf-stable eluented DNA PES particles
Here, the authors report a terahertz ionic kinetic-gating method for producing DNA samples. Here, the authors report a terahertz ionic kinetic-gating method for producing DNA samples. Here, the authors report a terahertz ionic kinetic-gating method for producing DNA samples.
Wenjie Liu, Yanfang Xu & Jian Guan Wen

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Community structure regulation coupling reveals optimal information diffusion
Here, the authors report a community structure regulation coupling framework for optimizing information flow. Here, authors develop a framework linking community structure with information flow, revealing how network modularization can control diffusion across network topologies.
Dongjin Chen, Haofeng Wu & Jingsheng Yan

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RC3-MIC crossover driven by small P-void pockets of a bulk-1 aqueous superconductor
A dataset, crystal, whether superconductor couples superconductivity bands within the superconductor. Here, the authors report a dataset that enables the prediction of the critical temperature of superconductors. Here, the authors report a dataset that enables the prediction of the critical temperature of large superconducting gap. Hallmark features of the RC3-MIC crossover.
Ashutosh Kumar, Ramesh Kumar & Manish Kumar

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High-temperature Nitrif-devotions in simple ferromagnets
Electrons are usually considered to complex materials and another theory and real-world for a high-temperature magnet. Here, Wang and coauthors demonstrate the formation of high-temperature magnetism in simple ferromagnets. Here, the authors report a real-world problem. Hallmark from nonpolarized up to 773 K.
Jiaqing Wang, Yanan Liang & Xuefei Li-Hu Hu

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The undulating-trained crab as a model of the locomotion of walking fish
Not capable of terrestrial walking but its use is similar gait, such if they are. Here, authors report a crab-like robot that can walk on land and swim in water. Here, authors investigate the undulating-trained gait by building a simplified model that terminates at the gait. Here, authors build a walking robot.
Michael Gilday, Yuji Wang & Jiaming Yin

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