

Funding of Key Program Projects in 2010

	Project Title	Applicant
1	Nonlinear partial differential equations of hyperbolic type and mixed type	Chen Shuxing
2	Qualitative Theory and Related Topics of Delay Differential Equations and Discrete Systems	Yu Jianshe
3	Nonlinear Functional Analysis and Infinite Dimensional Dynamical Systems	Zhong Chengkui
4	The arithmetic and geometry of automorphic forms	Liu Jianya
5	Mathematical problems in quantum field theory and string theory	Wu Ke
6	User-Friendly High Efficient Numerical Methods and Applications	Huang Yunqing
7	The theory of complex surface modeling and its application in scientific computing	Chen Falai
8	Some Problems in Several Complex Variables and Complex Geometry	Zhou Xiangyu
9	New concept energy absorbers and their application in crashworthiness design of aircraft	Yang Jialing
10	The model theory, high-performance numerical method and software development for three-dimensional explosion and impact problem	Ning Jianguo
11	Correlation Mechanism with Mechanics of Electromagnetic radiation resulted from hypervelocity impact	Zhang Qingming
12	On the modelling and nonlinear dynamics of the long-span cable stayed bridge	Zhao Yueyu
13	Multi-scale mechanics of the failure mechanism of the advanced fiber-enforced composites and their structures	Liu Renhuai
14	Theoretical and Experimental Investigations on Electro-Magneto-Thermo-Mechanics of Superconducting Materials with Multi-Coupled-Fields	Zhou Youhe
15	Dynamic coupling environment effects of water, sediments and pollutants under complex hydrodynamic conditions	Wang Daozeng
16	Mechanobiological study on therapeutical mechanisms of functional sickness of the eyeball	Chen Weiyi
17	Nonlinear Dynamics in Systems with Delay Coupling	Xu Jian
18	Experimental and theoretical study of interface and strain effect of lead-free ferroelectric thin film RAM	Zhou Yichun
19	the study on several key mechanics problems in microgravity condition	Hu Wenrui
20	Mechanobiological studies of the repairing bone and ligament tissues mediated by MGF	Yang Li
21	Key Problems in LAMOST Quasar Survey	Wu Xuebing
22	Studies of gamma-ray bursts and related astrophysical problems	Dai Zigao
23	Large angle fluctuation of CMB and very early universe	Li Tibeï
24	Study on the Satellite Timing Method Based on the Theory of Common View	Li Xiaohui
25	Dark energy and astronomical surveys	Zhan Hu
26	Studying some problems on the frontiers of research in the large scale structures in the Universe	Jing Yipeng
27	Special stages in the galactic black hole growth	Yuan weimin
28	Binary Evolution and its Applications	Han Zhanwen
29	The Research of Long-term Evolution and Stable Region for Objects in Synchronous Orbit Ring	Zhao Changyin
30	New Physics in Graphene and Related Low-dimensional Systems	Zhang Yuanbo
31	Effectively slowing, sub-mK optically cooling of neutral molecules and their applications	Yin Jianping
32	Tunneling Ionization and Related Phenomena in Molecular Frame	Ding Dajun
33	Study of high microwave permeability of heterogeneous nanostructural soft magnetic thin films	Xue Desheng
34	Elementary excitations and electromagnetic response in metallic and dielectric nano-and micro-structures	Peng Ruwen
35	Precise dopant control of oxide semiconductors for enhanced photo reactivity	Zhang Zhenyu

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36	The mechanism of high-sensitive biosensor based on phononic crystal	Wu Yihui
37	Laser Cooling of Gas Atoms in an Integrating Sphere	Liu Liang
38	the precision spectroscopy of trapped and cold Ca ion	Gao Kelin
39	Solid-liquid like transition in granular matters	Hou Meiyong
40	Novel pairing symmetry in unconventional superconductors	Wen Haihu
41	Investigation on Novel Quantum State and Phase-Transition of Low-Dimensional and Geometric Frustrated Magnetic Systems	Bao Wei
42	Research on cluster effect of unstable nuclei	Ren Zhongzhou
43	Study of key point of physics and technology in cosmic-ray muon imaging	Cheng Jianping
44	Structure of nucleon and spin effects in high energy reactions	Liang Zuotang
45	Key technologies research for Dielectric Wall Accelerator	Zhang Linwen
46	The simulation and experiment researches on heat transfer and flow of Thermal Non-equilibrium plasma	Xia Weidong
47	Study of hadron structures and properties of newly discovered hadrons	Zhao Qiang
48	Precise mass measurement of nuclides located far from the stability line	Zhou Xiaohong
49	Higher dimensional gravity: Theory, application and experimental test	Cai Ronggen
50	The experimental studies on energy scan program and properties of strong-interacting matter based on STAR-TOF	Ma YuGang
51	Synthesis strategy of the crystalline carbon-based energy-conversion and storage materials and the essence of the electrode process	Fuhonggang
52	Construction of multi-functional molecule-based materials and the regulation of structures and properties	Bu Xianhe
53	The study of hydrogen storage of boron and metal doped carbon structures and their composite materials	Wu Haishun
54	The structures and properties of fued-pentagon fullerene stabilized via exohedral derivatization	Xie Suyuan
55	Study on design of mesostructure and its enhancing effects to performance through controlling mass-transfer	Wang Dan
56	Self-assembly, Aggregate structures and properties of molecular materials	Li Yuliang
57	new methods and novel reaction on synthesis of heterocycle	Wu Anxin
58	Studies on total synthesis of several representative bioactive natural products	Yao Zhujun
59	The study of highly efficient catalytic asymmetric reactions and their applications in synthesis of natural products and chiral drugs	Zhou Qilin
60	Development of Metal-mediated Reaction in Heterocyclic Synthesis	Xi Chanjuan
61	Novel Reactions and Methodologies in the Synthesis of Heterocycles	Wang Yanguang
62	Study on the synthesis of fluorine-containing organic compounds, reaction rule and application	Zhao Gang
63	The study toward design of reaction based on the control of selectivity	Hou Xuelong
64	New Generation Relativistic Electronic Structure Theories, Methods and Program	Liu Wenjian
65	Theoretical simulation and Raman spectroscopic studies on mechanistic photochemistry of a molecule in aqueous solution and nuclear acids	Fang Weihai
66	Studies on the novel polymer semiconductors and their photo catalytic mechanism	Fu Xianzhi
67	Heterogeneous Catalysis for Production of High Value-added Chemical; Selective Conversion of Glycerol	Xu Boqing
68	Ordered porous hybrid films and multi-scale aggregates in solutions; Self-assembly, theoretical simulation and their response performances	Hao Jingcheng
69	Scientific Bases for Controlled Activation and Selective Transformation of Small Molecules and Biomass Related to Catalysis for Energy	Wan Huilin
70	Laser and SPM Investigations of Ionic Liquid Electrochemistry	Mao Bingwei

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71	Quantum theory and simulation of excitation energy transfer in photosynthetic systems	Yan Yijing
72	Fundamentals of novel carbon materials in catalysis	Bao Xinhe
73	Optical bio-composite organic materials for the recognition of tumor-related biomacromolecules and cell imaging	Wang Shu
74	Precise Synthesis of Functionalized Dendrigraft Star Comb Polymers Based on Living Anionic Polymerization	Li Yang
75	Fundamental research of cell and biomaterial interactions	Ding Jiandong
76	Regulation on condensed state and functionalization of non-bioactive proteins as well as their peptides	Shao Zhengzhong
77	Giant and shaped helical polymers; synthesis and characterization	Zhang Afang
78	New method for the enhancement of interfacial interaction of polymer composites by matrix crystallization on the filler surface	Fu Qiang
79	the research on novel second-order nonlinear optical polymers with dendritic structure	Li Zhen
80	Novel Bio-sensing Techniques for Molecular Diagnosis of Genetic Diseases	Yu Ruqin
81	Fundamentals of bio-molecules in multi-dimensionally confined nanospaces for developing novel biosensors	Xia Xinghua
82	The exploratory research on fluorescent probes; imaging of molecular events in living cells	Tang Bo
83	study on novel principle and method of complex protein separation based on moving reaction boundary	Cao Chengxi
84	Long range resonance energy transfer and its applications for biological and biomedical analysis	Huang Chengzhi
85	Methodology for Absolute Peptide/Protein Quantification Using Atomic Spectrometry and Elemental Mass Spectrometry	Wang QiuQuan
86	Studies on Engineering Basis of High Value Utilization of Magnesium Resource	Li Dianqing
87	Fundamental Study on Flow and Transport Performance of Multiphase Micro-Dispersed Systems	Luo Guangsheng
88	Theory and methodology for the design and controlled synthesis of enzyme nanogel	Liu Zheng
89	Chemical Engineering Foundation on preparation of noble metal nanomaterials and catalysts by biomass-based reduction	Li Qingbiao
90	Bioseparation matrices, methods and integration for antibody purification	Yao Shanjing
91	Adsorption, diffusion, and separation properties of molecular sieves/membranes	Zhu Weidong
92	Fundamental Research on Ionic Liquids and Industrial Applications for Cleaner Chemical Processes	Zhang Xiangping
93	Study on fundamental research of alkylation's process catalyzed by functional ionic liquids	Liu Zhichang
94	Study on the key scientific problems of biomimetic catalytic oxidations	Ji Hongbing
95	Formation mechanism and control methodology of typical pollutants in wastewater of coal chemical industry process	Wei Chaohai
96	Micro-interfacial processes of soil contamination and their molecular diagnoses and regulation principles	Zhou Qixing
97	Study on Mechanisms of Formation and Control Methods for UP-POPs from industrial processes	Zheng Minghui
98	Using yeast biomarkers high throughput detection system to study environment-gene interaction mechanism and its significance in early warning of pollution and health risk assessment	Dai Heping
99	System studies on the synthesis regulation mechanism of Penicillium decumbens cellulase system	Qu Yinbo
100	The research on the molecular mechanism for the synthesis and regulation of bacteria surface polysaccharide antigen	Wang lei
101	Molecular mechanism of important regulatory genes involved in the biosynthesis of secondary metabolites in Streptomyces	Tan Huarong
102	Molecular mechanisms of conidiogenesis mediated by small GTPase Rac1 in Magnaporthe oryzae and its evolution	Wang Zonghua

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103	Studies on the interactions between rice dwarf virus encoded RNA silencing suppressors with its host	Li Yi
104	Tomato as a model to study plant resistance against necrotrophic pathogens	Li Chuanyou
105	Mechanisms of plant NB-LRR R protein mediated race-specific disease resistance	Shen Qianhua
106	The identification of host plant signal(s) mediated Xcc gene expression	Fang Rongxiang
107	New Mechanism of Viral Suppressor of RNA-Silencing interferes with the host epigenetic regulation	Guo Huishan
108	Biosynthesis of thiazole ring of camalexin, a phytoalexin pathogen in Arabidopsis	Ren Dongtao
109	The dialect and its adaptation evolution of bats	Feng Jiang
110	Integration, maintenance and biological control efficiency of biodiversity in the agricultural ecosystem of North China	Ge Feng
111	Patterns and maintaining mechanisms of grassland biodiversity on the Mongolian Plateau: A multiple-scale approach integrating field experiments and survey	Bai Yongfei
112	Toward an integration of niches and neutrality for biodiversity maintenance: theoretical and empirical approaches	Zhang Dayong
113	Mechanisms of the resistance of native plant function group to exotic plant invasion	Peng Shaolin
114	The role of plant-pollinator interactions in community assembly of alpine meadows	Huang Shuangquan
115	Molecular basic research on the introduction of Key enzymes of C4 photosynthesis pathway into <i>Populus simonii</i> X <i>P. nigra</i>	Wang Baichen
116	the study of calmodulin regulation mechanism of development of poplar xylem	Lu Mengzhu
117	structural and functional studies of protein complexes in Hippo pathway and drug screening	Xu Yanhui
118	Structural and Functional study of MAGE-RING ubiquitin E3 ligase complex	Yang Maojun
119	Molecular Regulation of Transcription Factors IRF3 and NF- κ B During Host Anti-Viral Response	Wang Chen
120	Protein acetylation and the regulation of insulin sensitivity	Zhai Qiwei
121	The role of GSNOR in nerve system	Chen Chang
122	Structural and functional study of eukaryotic Origin Recognition Complex (ORC).	Lin Yingfang
123	The glycosylation and its regulation of proteins related to cell growth and development	Jin Cheng
124	Dissecting the network of matrix attachment region binding proteins in the higher-order chromatin organization of clustered genes	Liu Depei
125	Function and regulation of nuclear F-actin in baculovirus replication	Chen Xinwen
126	Mechanism and application research of the signal transduction in innate immunity	Ge Baoxue
127	ECM1 regulation in Th cell migration and pathogenesis	Sun Bing
128	Structural and functional studies of new $\delta\beta$ T cells	Gao Fu
129	The mechanisms of inflammasome-mediated acute fulminant hepatitis	Tang Hong
130	Basic Researches on the regeneration and reconstruction of cardiac tissue based on injectable biomaterials	Wang Changyong
131	Differentiation regulation and role of stem cells in construction and regeneration of periodontal tissue under influence of inflammation	Jin Yan
132	Molecular mechanism underlying dendritic spatial distribution and axonal path-finding of cerebral pyramidal neurons	Ding Yuqiang
133	Molecular mechanism of neuron polarization	Rao Yi
134	Investigation on the mechanisms underlying development of direction-selective circuitry in the retina	He Shigang
135	Genetic mechanism of central complex development in <i>Drosophila</i>	Liu Li
136	The mechanism study of Cide protein in lipid homeostasis	Li Peng

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137	Study of Omega-3 Polyunsaturated Fatty Acids (n-3 PUFAs) and vitamin D for Cardiovascular Diseases	Wang Fudi
138	Function and Mechanism of TGF-beta Related miRNA in Cardiovascular Development and Homeostasis Maintenance	Yang Xiao
139	The functional studies and expressional regulation mechanisms of myostatin-regulated miRNAs during skeletal muscle development	Zhu Dahai
140	Acetylation coordination of metabolic enzymes activities within and among metabolic pathways	Zhao Shimin
141	The molecular mechanism and physiological role of autophagy feedback loop	Yu Li
142	Study of the regulation network of Ran GTPase and mitotic kinases in cell proliferation	Zhang Chuanmao
143	Large scale screen for novel auxin synthetic/metabolic mutants in plants	Guo Guangqin
144	The mechanism of p53 family members in regulating cell metabolism	Wu Mian
145	Ubiquitination in plant development and plant environment interaction	Xie Qi
146	study of molecular mechanism for the stem cells commitment to adipocyte	Tang Qiqun
147	Molecular Mechanism of Drosophila Intestinal Stem Cell Maintenance and Directional Differentiation	Lin Xinhua
148	Role of inositol 1,4,5-trisphosphate receptors in cell fate determination during embryonic stem cells differentiation	Yang Huangtian
149	Biochemistry mechanism for maintaining quality of harvested fruits in storage periods	Tian Shiping
150	Molecular Regulatory Mechanism of Postharvest Quality of Fruit and Vegetables Based on Roles Played by ERF Gene Family	Chen Kunsong
151	High-resolution mapping of salinity-tolerant genes and their action mechanisms in wheat introgression line	Xia Guangmin
152	Molecular characterization of genes involved in early resistance response of indigenous wheat germplasm Wangshuibai to Fusarium head blight	Ma Zhengqiang
153	Exploitation of genes conferring resistance against rust diseases and tolerance to abiotic stresses in wild emmer wheat, <i>Triticum dicoccoides</i>	Peng Junhua
154	Discovery, fine genetics mapping and map-based cloning of powdery mildew resistance genes derived from wild emmer	Liu Zhiyong
155	Genome-Wide High-throughput Mining, Functional Genetic Dissection and Utilization of Excellent Disease Resistance Genes in Cucumber Germplasms	Xie Bingyan
156	Establishment of the related animal model of Uncv hairless mice and research on the regulation mechanism of EGF/EGFR signal in hair follicle development	Zeng Lin
157	Ciliates, important models of cell development, pattern formation and phylogeny	Song Weibo
158	Silkworm as a research model for lepidopteran pests to discover gene targets for novel method of pest management	Huang Yongping
159	The establishment and application of transgenic mouse model of EZC-breast cancer stem cells	Xie Xiaoming
160	Molecular genetic and genomic mechanisms of zebra fish embryonic circadian rhythmicity	Wang Han
161	Studies on the artificially induced dedifferentiation and re-differentiation of the differentiated ovary model	Wang Deshou
162	Mechanism study on invasion and escaping of the serious food borne zoonosis trichinellosis pathogen	Liu Mingyuan
163	The study on genomics and molecular pathogenesis of extra intestinal pathogenic <i>Escherichia coli</i>	Chen Huanchun
164	Regulatory mechanism of the opportunistic pathogenicity of <i>Toxoplasma gondii</i>	Chen Xiaoguang
165	Temporal and Spatial Variation Patterns of Plant Phenology over East Monsoon China in Global Warming Context	Ge Quansheng
166	Environment changes and abrupt climate events since MIS3 in Songnen Plain	Zhang Hucai

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167	On the circulation effect of stalagmite oxygen isotopes from mosoonal China and reconstruction of time series over past millennia	Tan Ming
168	Carbon storage and sequestration potential under global change in the typical temperate steppe in northern China	Wan Shiqiang
169	The Adaptation of Carbon Stock Function in Alpine Grassland on Tibetan Plateau to Human activity and Maintaining	Zhao Xinquan
170	The mechanism study of land-atmosphere interaction on the Tibetan Plateau and land surface model development	Liu Huizhi
171	Halogenated greenhouse gases observation and emission estimate in China	Zhou Lingxi
172	Studies on the Relationship between the Biodiversity Origin and Evolution of the Qinghai-Xizang Plateau and Environment Changes	Chen Yifeng
173	Diversification of Metazoa and its environmental background at the eve of Cambrian Explosion	Hua Hong
174	Evolution model from autotrophic to heterotrophic cell and hydrocarbon-generation control experiments	Wu Qingyu
175	Response of fossil microorganisms in Tibetan lake sediments to changes of paleoclimatic and paleoenvironmental conditions	Dong Hailiang
176	The Neogene Hengduan Mountain Floras and their paleoenvironmental evolution	Zhou Zhekun
177	Geology and geochemistry of Late Permian coals in eastern Yunnan and western Guizhou and the geological cause of the Xuanwei lung cancer	Shao Longyi
178	Geochemistry, geochronology and regional correlation of ophiolites from eastern Junggar, central and south Mongolia	Jian Ping
179	Sedimentary successions evolution and it's tectonic controls on the Neoproterozoic wedge-shaped strata in South China	Wang Jian
180	Two Early Precambrian granulites (HT-HP and HT-UHT) in North China Craton; their distribution, petrogenesis and tectonic implication	Zhai Mingguo
181	Cenozoic tectonic deformation and landscape evolution of the Qilian Shan	Zhang Peizhen
182	Evolution of basin/mountain system and continental collision along the northern margin of Middle-Upper Yangtze	Liu Shaofeng
183	the rupture process of earthquake and its application in real-time seismology	Yao Zhenxing
184	Strike slipping of the Karakorum and the Altyn Tagh faults and its relation to north-south trended normal faulting of the Tibetan Plateau: From kinematic observations to mechanical modeling	He Jiankun
185	Alkaline magmatic activity and Au,Cu,U metallogeny occurring in the northern part of Northern China craton	Nie Fengjun
186	Coal-bed Methane Occurrence and Reservoir during Complex Structural Evolution of the Basin-Orogen	Hou Quanlin
187	Study of geological setting and superimposed mineralization in Carlin and Carlin-like gold deposit, western Qinling	Liu Jiajun
188	Ni-Cu-Co metallogenesis of Late paleozoic mafic-ultramafic intrusions in Eastern Tianshan and Beishan and their geodynamic setting	Qin Kezhang
189	Study on particles related to the concealed ore deposits in Inner Mongolian Plateau	Cao Jianjin
190	Tectonic Dynamic, Basin Superimposed Characteristics and Oil-gas Accumulation in Sichuan Basin, China	Li Zhongquan
191	The study on the distributed model of glacier mass and energy balance	Ye Baisheng
192	Altitudinal belt-based quantification of mountain effect	Zhang Baiping
193	Modelling Study on Ecosystem Dynamics in Shallow Lakes	Xu Fulu
194	Research on the soil evolution and driving mechanism under drip irrigation in Taklimakan desert shelterbelt with saline water	Lei Jiaqiang

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195	Pollution processes of the selected POPs in soil-plant system and their effects on the quality of primary food from crops	Jiang Xin
196	Erosion interference on vegetation restoration and plant traits resisting soil erosion in the loess hilly region	Jiao Juying
197	Effects of Subtropical plantation forest on soil organic carbon storage and its regulating mechanism	Wang Silong
198	Research on mechanism of passive microwave remote sensing of the freeze/thaw process over land surface	Zhang Lixin
199	Change of temperate typical steppe ecosystem service and regional eco-safety in Inner Mongolia	Li Xiaobing
200	Study On Distributed Xin An Jiang Model	Zhang Xingnan
201	Palaeoflood hydrological study in 10000-year time-scale in the upper reaches of the Hanjiang River-source region of the middle canal for South-to-North Water Diversion	Huang Chunchang
202	Coordinated Regulation of Hydraulic and Canopy Stomatal Conductance on Forest Transpiration	Zhao Ping
203	Impacts to water resources of climate and glacier changes in the Karakoran and West Kunlun Mountains	Liu Jingshi
204	The non-normal release process of internal phosphorus and the relation with hydrobiology	Yang Linzhang
205	Estimation and Prediction on Thawing Hazards Influenced by the Climate Change and Engineering Activities in Permafrost Regions of the Qinghai-Tibet Plateau	Niu Fujun
206	The mechanism of hazard generation and risky control for major railways and highways from Sichuan to Tibet	Cui Peng
207	The influence of land use/cover change in the typical district of Songnen plain on lake and swamp ecosystem and regulation and control mechanism	Zang Shuying
208	Driving forces and regulating mechanism of spatial pattern and processes of Beijing urban ecosystem	Ouyang Zhiyun
209	The Mechanism and Evaluation of Impacts of Land Use Change on Ecological Service Function in Taihu Basin, China	Yang Guishan
210	Study on the transport of dense nonaqueous liquids (DNAPLs) in the heterogeneous soil-groundwater system and its numerical simulation	Wu Jichun
211	Crack and void coupling catastrophic mechanism on soft rock structured slopes and their environmental effect model	Zhou Cuiying
212	THMC modeling for multi-phase GMZ bentonite using as buffer/backfill materials for HLW deep geological disposal	Ye Weimin
213	Fast excavation triggered rock mass damage in Qinghai-Tibet plateau and its impacts on environment	Wu Faquan
214	Generalized critical displacement criteria and prediction method for slope instability	Qin Siqing
215	Research of soil erosion process and ecological environment for LUCC in the Dianchi basin	Yang Hao
216	An integrated experimental and modeling study on the rate and mechanism of natural/re-mercury emissions from agricultural land	Feng Xinbin
217	Key-phases of Margin Rupture in the north of the SCS and the Deep Constraints of Its Tectonic Reversal	Fang Nianqiao
218	Research on data assimilation issues in the ocean reanalysis	Han Guijun
219	Dynamics of spatial-temporal evolution of internal waves and its response to the Kuroshio's seasonal variations in the Northern South China Sea	Hou Yijun
220	The Relationship of Generation and Development and Climate Environment Change on the Circulation Depositional System in the Middle Southern Yellow Sea	Li Guangxue
221	The first Chinese OBS array experiment at the ultra-slow spreading Southwest Indian Ridge	Chen Yongshun

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222	Production, distribution, transformation and environmental impacts of biogenic sulfur in the East China Sea and the Yellow Sea	Yang Guipeng
223	Late Quaternary reconstruction of paleoceanographic and climatic evolutionary history in the western Arctic Ocean	Wang Rujian
224	Observation study on the electric structure and discharge processes in hailstorm	Zhang Yijun
225	New theory of Rossby wave propagation in non-uniform basic flow and Asian-Australian Monsoon interaction	Li Jianping
226	The interactions between orographic clouds and aerosols in Southern China: A observational and theoretical study	Yin Yan
227	Numerical simulation of magnetosphere-ionosphere coupling: nonlinear shear Alfvén waves and ionospheric feedback effects	Lu Jianyong
228	Study on generation mechanism for dayside corona aurora and its classification	Yang Huigen
229	Formation of the high speed flows in the plasma sheet and their roles in magnetosphere activities	Fu Suiyan
230	Numerical Prediction Modeling of Corona/Interplanetary Process for Solar Storms	Feng Xueshang
231	Micro-mechanism of enhancing plasticity by deformation-induced phase transformation in advanced high strength steels	Rong Yonghua
232	Interface and Size Effects in Metal Nanocomposites	Lu Yafeng
233	Formation mechanism and micro structural control of the self-organized core-type microstructure in Cu base immiscible alloys	Liu Xingjun
234	Investigation on magnetism impacted metallurgy and novel magnetic phase transition materials	Wu Guangheng
235	High Pressure Theoretical Design and Experimental Synthesis of Transition Metal Compounds Super hard Multi-function Materials	Cui Tian
236	The investigations on blending materials with antireflection and up conversion properties for enhancing photovoltaic efficiency of semiconductor solar cells	Yan Xiaohong
237	A study on abnormal electromagnetic media in optical frequency based on nature existed materials	Zhou Ji
238	Theoretical study on the electrical optic (EO) effects of inorganic crystals and development of new EO crystals	Wang Jiyang
239	design & control deposition of film materials for saving-energy coating glass	Zhao Xiujian
240	Study on the environmental barrier coatings for ceramic matrix composites	Cheng laifei
241	Research on free-sintering technology and properties of non-oxide composite refractory	Huang Zhaohui
242	Thermochromic Glass Coatings: Materials Design, Preparation and Applications	Minoru Kanehira
243	Questions and Solution of Organic Polymer Surface and Interface-New Chemistry of C-H bond Conversion Induced by UV light in Organic Surface	Yang Wantai
244	Biopolymer-based nanoscale assemblies and their drug delivery properties	Jiang Xiqun
245	Key Scientific Issues in Manufacturing PLA films	Yang Mingbo
246	flow-induced polymer ordering and its application on morphological control during polymer processing	Li Liangbin
247	Investigations on Responsive Polymer-Based Chemosensors and Biosensors	Liu Shiyong
248	Key Materials and devices physics of organic field-effect transistors	Hu Wenping
249	Materials and Device Structures for Fluorescent/Phosphorescent Hybrid White Organic Light-Emitting Diodes	Zhang Xiaohong
250	Study on stability of high and steep slope in deep-depressed open pit mine	Cai Meifeng
251	Rheoforming of Semi-solid Alloy under coupling effect of shearing /Vibrating	Guan Renguo
252	The basic research on water inrush mechanism and prevention in deep coal mining	Cheng Jiulong
253	The theory and method of wettability alteration to gas-wetness in EOR of low permeability oil and gas fields	Li Kewen
254	Research on large surface coal mine high and steep slope stability theory	Cai Qingxiang

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255	The control on the aspect ratio of kaolinite and its influence on properties of rubber nanocomposites	Liu Qinfu
256	The basic research on the application of the supercritical carbon dioxide in unconventional reservoirs	Sun Baojiang
257	Theories and key technologies of Operational optimization for discrete shop manufacturing system with high efficiency and Low Carbon	Shao Xinyu
258	Dynamics behavior and coupled field adjustment in multiscale manufacturing of flexible electronics based on electrohydrodynamic printing	Yin Zhouping
259	Forming Technology and Equipment Research of 3D Woven Composites	Shan Zhongde
260	Fundamental research on laser welding of lightweight high strength steel sandwich panels	Wu Yixiong
261	Research on cross-scale key manufacture theory and technology of implantable flexible artificial-nerve system for paralysis rehabilitation	Liu Jingquan
262	Design theory and method for coupled multi-field problems of electronic equipments	Duan Baoyan
263	New theory and technology of fault prognostics and running safeguard for key equipment	He Zhengjia
264	Research on the methods of fault prediction and diagnosis of the key transmission system based on local strong signals and position domain transfer method	Shao Yimin
265	Study on the principles of splitting sensible and latent heat load in air conditioning for buildings	Zhang Xiaosong
266	Basic research on energy conservation and optimum control of thermal power generating system	liu Jizhen
267	Advanced Theory on Heat Transfer Enhancement and its Mechanism Research	Liu Wei
268	Key issues in gasoline direct injection engines for high efficiency and low emissions	Wang Jianxin
269	Enhancement of phase-change heat transfer on three-phase contact region by EHD	Zheng Ping
270	Key fundamental research on full use of biomass components by thermo-chemical conversion	Chen Guanyi
271	study on thermo physical issues of fire protection at low atmospheric pressure of high altitude	Yang Lizhong
272	Research on the ion current and total electric field of ultra high voltage direct current transmission lines under complex conditions	Cui Xiang
273	Ambient Signal Based Power Grid Dominant Dynamic System Identification and Wide-area Robust Adaptive Control	Han Yingduo
274	Study on stability analysis and control methods of the multi-infeed HVDC system in sending terminal for strong smart grids	Li Xingyuan
275	Research on key technology in integrated design of low-speed and high-torch permanent magnet machine system	Xia Changliang
276	Research on Power System Protection Based on Parameter Identification	Suonan Jiale
277	Biophysical mechanism for bioeffects of extremely low frequency magnetic field based on endogenous biomagnetite	Song Tao
278	Research on prediction and pre-warning of Regional heavy air pollution and its prevention	Cheng Shuiyuan
279	Investigation into Fundamental Issues in Asphalt Pavement Structural Design	Zheng JianLong
280	Study of Process and Mechanism of Enhanced Wastewater Treatment Based on Multipurpose Sludge Reuse	Li Guibai
281	Study on stochastic theory of asphalt pavement fatigue damage accumulation	Zhang Xiaoning
282	Fundamental Research on Thermal Environment and Energy Saving Technologies for Rural Housing	Yang Xudong
283	Advanced Design theory and structural system of high performance steel structures	Shi Yongjiu
284	Theoretical study on structural safety of large-scale urban underground engineering under strong earthquakes	Zhang Jianmin
285	Behavior and design method of steel structures based on full-range energy dissipation mechanism under dynamic loading	Chen Yiyi
286	Seismic response mechanism and seismic resistance of long tunnel at great depth	Qiu Wen'ge

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287	The research for the wetland development law and the restoration method for the Dongting Lake under the changes of both water quantity and water quality by the construction of the Three Gorge project	Zeng Guangming
288	Study on transportation of pollutants and adjustment and control mechanics of reservoir	Chen Yongcan
289	Formation and failure mechanisms and risk control methodology for barrier lakes with high risk	Zhang Hongwu
290	Basic Theories of Non-uniform Sediment Transport	Wu Baosheng
291	Study of full-characteristics of reversible turbine and their impact on hydraulic transient process based on spatial-surface concept	Yang Jiandong
292	Research on Some Basic Issues of Ship Multidisciplinary Design Optimization	Liu Zuyuan
293	Movement and transformation of agriculture non-point source pollutants and their environmental effects	Zhang Renduo
294	Study on Basic Theory and Key Technology of Bell-shaped Oscillator Angular Rate Gyro	Fu Mengyin
295	Basic theory and key technologies for neural information analysis and brain machine interactions	Zheng Xiaoxiang
296	Research on Vibro-Acoustic Imaging Based on Coded Ultrasound and Its Application	Chen Siping
297	Theoretical Research on Multi-sensor Systematic Errors Steady Fusion Estimation and Data Alignment-correlation	He You
298	Key Issues in Land Broadband Wireless Communications with Super High Mobility	Fan Pingzhi
299	The theoretic principle and key technologies of communication based on deep-space exploration	Zhang Qinyu
300	Theory and technology in Deep Space Communications based on Interplanetary Internet	Zhang Gengxin
301	Optics-based arbitrary waveform generator and its applications to optical fiber transmission system	Zhou Bingkun
302	The research on joint source channel coding /decoding theory and methods for insuring information security	Tu Guofang
303	Research on FTIR-ATR signal of complex solution	Peng Silong
304	Multi-ethnic character recognition and interpretation	Ding Xiaoqing
305	The GEO SAR signal acquisition and processing theory and key technology	Long Teng
306	A study on target information obtaining and processing for new sky OTH radar	He Zishu
307	A study on non cooperative targets detection technique with Hybrid HF Sky-Surface system	Fan Junmei
308	A Complexity Study of Communication, Cryptography, and Quantum Information Processing	YAO Andrew ChiChih
309	M-solvability-complexity and the model theory of computer science	Fu Yuxi
310	Research on Computational Models and Algorithms Inspired by Cells (Membrane and Nucleic Acid)	Pan Linqiang
311	Research on Multimedia Coding Based on Compressive Sensing	Yin Baocai
312	Value-Oriented Software Service Methodology: Theory, Method and Applications	Xu Xiaofei
313	On the Service Oriented Software Theory Method and Application	Wang Qianxiang
314	Data Management Technologies for Data Intensive Computing	Li Zhanhuai
315	High Efficiency Model And Architecture Research for Terascale Embedded Computing	Zhang Chunyuan
316	Optimization Theory and Technology for High Performance towards Key Applications	Mo Zeyao
317	Theory and method on network information fusion and knowledge service	Yin Jian
318	Inducing Human Vision and Touching Cognition to Achieve Robot-Human and Cooperation Imitated Intercommunion	Qiao Hong
319	Theory and Application Study on Image Invariants Based on Cognitive Models	Luo Zhongxuan
320	Research on the key technology and character of image invariance based on model of cognition	Li Fanzhang
321	New approaches to the analysis of secure protocols	Cao Fuzhen
322	Research on Fundamental Theory and Critical Technologies for Cyber-Physical Systems	Li Jianzhong
323	Data-Based Analysis and Control of Automotive Power Systems	Chen Hong
324	Data-based analysis and design for nonlinear control systems	Liu Derong

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325	Theory and method of data-based optimal scheduling of complex production process and its application in metallurgical industry	Wang Wei
326	Data-Driven Optimal Scheduling Theory and Methodologies for Complex Production Processes	Wu Qidi
327	Researches on Fundamental Theory and Key Technology of Fault Diagnosis & Monitoring for Complex Control Process Based on Data Driven Approach	Zhang Huaguang
328	Data Driven Fault Prognostics and Health Management for Complex Engineering Systems	Fang Huajing
329	Hybrid electric vehicle energy and drive systems optimal control theory and key technologies	Zhang Chenghui
330	Optimal Control Theory and Key Technology for Civil Wastewater Treatment Process	Qiao Junfei
331	Moving Objects Detection, Tracking and Abnormalities Analyzing in Multi-camera Cooperative Surveillance	Tian Yonghong
332	Data-driven Multi-dimensional Media Sensing and Understanding	Dai Qionghai
333	Cloud Computing Based Massive Data Mining	Shi Zhongzhi
334	Toward cloud computing based very large scale data mining	Li Juanzi
335	Real time environmental modeling and autonomous behavior optimization for mobile robots in off-road field	Han Jianda
336	Multi-model brain functional information fusion theory and method	Chen Huaifu
337	Improved Si solar cells efficiency by utilizing quantum size effect and impurity intermediate band	Xu Jun
338	The basic scientific research on the silicon CMOS photonic integration used in optical interconnections	Chen Hongda
339	Study on epitaxy of germanium on silicon and related devices	Cheng Buwen
340	Research on Key Technology of High-Performance CMOS Image Sensor under 90nm process	Li Binqiao
341	Surface plasmon polariton devices and integration based on metal/dielectric nano structures	Zhang Jiasen
342	Study on MEMS Non-cooled Inferred Imaging Technology with High Resolution and Frame Rate	Zhao Yuejin
343	Investigation of printing technique for polymer light emitting display	Jun Biaopeng
344	Theory and key technology of autostereoscopic 3D display based on lenticular lens and parallax barrier	Wang Qionghua
345	Electroluminescent Devices with Surface Plasmon Polariton Enhanced Emission through Metal/Dielectric Nano-Structures	Liao Liangsheng
346	Surface plasmonic nanoaperture laser	Song Guofeng
347	Plasmonic Integrated Circuit based on Metal/Dielectric nanostructure	Huang Yidong
348	Nanoscale propagation SPP bio-chemical sensors: principles and chip-level integrations	Tong Limin
349	Novel high-sensitive and high-throughput SPR sensing and imaging based on all-optically manipulated SPP	Yuan Xiacong
350	Photodynamic effect for vascular target treatment and its monitoring techniques	Gu Ying
351	study on large aperture off-axis high order aspheric mirror manufacturing and testing technology	Zhang Xuejun
352	measurement of refractive index and birefringence based on the conversion effect between optical path and frequency of intra cavity in microchip Nd:YAG lasers	Zhang Shulian
353	Theory and its application on high-dimensional composite data analysis in Economic Management Area	Wang Huiwen
354	Study on Theory and Methodology of Product-Lifecycle-Oriented Knowledge Coordination Management	Dang Yanzhong
355	Investment decision-making and risk management employed strategy	wang tie nan
356	Investment decisions and risk management based on the corporate strategies.	Chen Shou
357	Research on Supply Chain Management Based on Behavioral Operations Research	Zhao Xiaobo
358	Theory and applications of high-dimensional complicated data analysis for economic management	Liang Jiye
359	Study on modeling of structure and process and design of organization in large complex man-machine system	Tan Yuejin

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360	Chinese Strategic Leadership Characteristics, Development, and its Influences on Firm Outcomes	Wang Hui
361	Re-examine leadership from perspectives of history, context and action: Theoretical and empirical research based on Chinese leaders	Xi Youmin
362	A Study on Organizational Culture and Organizational Creativity	Gu Qinxuan
363	The research of theory and method for production scheduling optimization with batch decision-making	Tang Lixin
364	Management accounting research in China of based on value, oriented on strategy	Pan Fei
365	Research on the Theory and Method of Business Management Accounting in China	Hu Yuming
366	Research on Theory and Policy of Internationalization of National 'ZiZhu' Innovation System	Liu Yun
367	Study on Theory and Policy about Internationalization of National Independent Innovation Systems under the Framework of PORC	Su Jingqin
368	The public goods provision and the development of rural China	Shi Yaojiang
369	The Evolution Mechanism, Optimization Path and Managerial Implications of Industrial Ecosystem	Geng Yong
370	Dynamic and management of ecological industrial system	Wang Rusong
371	protective effects of AMP-activated protein kinase on heart remodeling in hypertension and its molecular mechanism	Zhang Youyi
372	Relationship between mitochondrial DNA mutation and the development and progress of hypertension in Chinese Hans people and its mechanism	Wang Shiwen
373	Prostaglandin E2 receptor subtype 4 and blood pressure regulation	Guan Youfei
374	The impact of Peroxidase activity of Prostaglandin H Synthesis on Hypertension and its complications	Yu Ying
375	Predisposition to hypertension and hypertensive heart failure by reduced cardiovascular insulin sensitivity: Effect and mechanisms of actions	Gao Feng
376	Programming mechanisms of fetal origins in hypertension and its complication stroke	Xu Zhice
377	The function, mechanism and regulation of novel ion channel associated gene KCTD9 in liver injury	Ning Qin
378	Molecular mechanisms of inflammation causing fatty acids redistribution in liver	Ruan Xiongzhong
379	Involvement of different kinds of cells on liver injury	Li Liying
380	Molecular mechanisms of synchronized regeneration of hepatocytes and hepatic non-parenchymal cells after liver injury	Dou Kefeng
381	G-protein coupled receptor 48 regulates the balance between energy expenditure and fat storage	Ning Guang
382	Gastric fuel sensing mechanism in the regulation of energy metabolism and development of obesity	Zhang Weizhen
383	new mechanism of energy: Stat3 acetylation mediating gluconeogenesis in liver	Gao Qian
384	the function of TM4 involving in energy metabolism and development of obesity	Hu Renming
385	Exploring the genetic basis of pathological myopia	Kong Xiangyin
386	Research for the molecular pathogenesis of gene-genes interaction of primary open angle glaucoma	Wang Ningli
387	Identification of novel deafness genes and underlying mechanism	Yuan Huijun
388	Molecular pathogenesis of Gorlin syndrome and its related diseases and the novel therapeutic approaches	Li Tiejun
389	A study on molecular genetics of ALS	Fan Dongsheng
390	Molecular and Cellular Mechanism of Adult Neurogenesis in the Repair of Brain Following Stroke	Sun Fengyan
391	The role of astrocytes in neurovascular injury and functional reconstruction after ischemia	Wang Wei
392	Identification of nuclear BKca channel and its role in ischemia induced neuronal death.	Gao Tianming
393	Role of nNOS in neurogenesis and synapse formation following brain injuries	Zhu Dongya
394	Novel mechanisms of GSK-3 α/β regulation: therapeutic Targets for Parkinson's Disease	Li Mingtao
395	The study on c-Abl signaling transduction in the oxidative stress-induced neuronal cell death	Yuan Zengqiang

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396	Retinoid signaling mediated stress injury and hyperactivity of CRH neurons in the pathogenesis of depression	Zhou Jiangning
397	Diagnostic Model and Neuropathological Mechanisms underlying Depressive Disorder Based on Multi-modality Neuro imaging and Massive Data Processing	Gong Qiyong
398	Methodology and Applications of Multi-modal Image Processing Based on Brain Network Computation	He Yong
399	Gene decay and host adaptation: establishing animal infection models by Salmonella typhi and other host-adapted salmonellae	Liu Shulin
400	Mechanistic studies on the antiviral function of ZAP	Gao Guangxia
401	Research on the interactional effects between the essential replication proteins of human cytomegalovirus and their cellular factors	Liu Fenyong
402	Overactive immune response and severe pandemic influenza A(H1N1) 2009	Wang Chen
403	Multiple organs Infection model of H5N1 and H1N1	Gu Jiang
404	an applied basic research on the key points of the bone and periodontal repair and reconstruction in dento-maxillofacial trauma	Zhao Zhihe
405	Enhancement of the healing strength and inhibition of adhesions of the injured tendon by gene therapy	Tang Jinbo
406	The role of FGFR3 in regeneration of articular cartilage	Chen Lin
407	Regulation of migration and differentiation of epidermal stem cells by bio-electric field in wound and its mechanisms	Jiang Jianxin
408	The role of tumor microenvironment on cancer metastasis and recurrence of hepatocellular carcinoma	Fan Jia
409	The role of platelet in pre-metastatic niches formation and lung metastases	Liu Junling
410	The Study of the Role of miRNA in Cancer Progress and Metastasis Through using Self-assembled Cell Microarray	Xi Jianzhong
411	Role of autophagy on the metastasis and recurrence of hepatocellular carcinoma in the tumor micro-environment and its mechanism	Wei Lixin
412	The investigation for the role of osteopontin in tumor microenvironment and epithelial mesenchymal transitions.	Zhao Jian
413	Molecular mechanism of migration, invasion and metastasis regulated by Serglycin in Nasopharyngeal Carcinoma cells	Qian Chaonan
414	Study the roles and mechanisms of miRNA-related gene regulatory networks in multi drug resistance of gastric cancer	Fan Daiming
415	The function and regulative mechanism of microRNA in HER2 signaling-mediated metastasis of cancer cells	Yang An'gang
416	Hypoxic and inflammatory microenvironment of colon cancer affects the self-renewal and differentiation of colon cancer stem cell by regulating the RNA binding protein	Lu Zifan
417	The critical role of Mediator Med23 in ras-active lung cancer	Wang Gang
418	The positive-feed back and constitutive activation of inflammation signaling on the progression and development of cancer	Li Jun
419	The role of fibroblast in inflammation-related tumor development	Qin Zhihai
420	Study on the Molecular Mechanisms of Aberrant Expression of Inflammation-Related Genes in Liver Cancer	Lin Dongxin
421	Screening of estrogen-like compounds in food and risk assessment of metabolic syndrome	Xu Shunqing
422	Rapid screening for hormonal pollutants in food by bionic photonic crystals and the mechanism investigation of combined effect at low-dose exposure to male	Gao Zjixian

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423	The quick-screening for chemical contaminants/ mycotoxin-produced fungi in aquatic products/ farm products/ flavorings and the safety evaluations for harmful substances in foods	Zhang Lishi
424	Regulation of allergen induced toll-like receptor expression and cytokine release from mast cells by interferon-lambda	He Shaoheng
425	The effects and mechanisms MRP8/MRP14 on antigen presenting cells and T cells	Jiang Yong
426	Mechanism for TLR2 or TLR4 differentially regulating the development of tissue fibrosis	Hu Zhuowei
427	The molecular mechanism of citrullinated antigen in pathogenesis of rheumatoid arthritis	Li Zhan'guo
428	New mechanism of activated antigen presenting cell from the site of inflammation in rheumatoid arthritis promote Th17 responses	Zhu Ping
429	Specific inhibition of Dyrk1A prevents the formation of pathogenic tau in Alzheimer's disease brain	Liu Fei
430	Kir6.1/K-ATP channel; a new neuro-protective target for Parkinson's disease	Hu Gang
431	The effect of histamine and its receptors on astrocytes function and glial scar formation after cerebral ischemia and the involved mechanism	Chen Zhong
432	Neuroprotective mechanisms of Parkinson's disease and novel pharmaceutical targets research	Wang Xiaomin
433	Research of Etiology and Pathogenesis of Coronary Heart Disease from Blood-stasis to Toxin	Shi Dazhuo
434	Identification of the Molecular Signature Contributing to the Susceptibility of Phlegmatic Hygro-sis Constitution to Metabolic Syndrome	Wang Qi
435	Study on mechanism of compatibility of two Zhimu herb-pairs based on analysis in vivo	Huang Chenggang
436	Basic research on composition law of herbal pair of herba ephedrae species	Luo Jiabo

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• Research Results •

Long-Range Topological Order in Metallic Glass

In June 17th issue of *Science*, Professor Jiang Jianzhong of Department of Material Sciences, Zhejiang University and his colleagues published a paper titled "Long-Range Topological Order in Metallic Glass". Prof. Jiang has received sustained support from NSFC since 2003.

This article was co-authored by an international group of 9 researchers.

According to the article, glass lacks the long-range periodic order that characterizes a crystal. In the Ce₇₅Al₂₅ metallic glass (MG), however, they discovered a long-range topological order corresponding to a single crystal of indefinite length. Structural examinations confirm that the MG is truly amorphous, isotropic, and unstrained, yet under 25 gigapascals hydrostatic pressures, every segment of a centimeter-length MG ribbon devitrifies independently into a face-centered cubic (fcc) crystal with the identical orientation. By using molecular dynamics simulations and synchrotron x-ray techniques, they elucidated that the mismatch between the large Ce and small Al atoms frustrates the crystallization and causes amorphization, but a long-range fcc topological order still exists. Pressure induces electronic transition in Ce, which eliminates the mismatch and manifests the topological order by the formation of a single crystal.