



## 科研成果

### R&D ACHIEVEMENTS

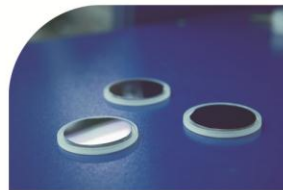
新世纪以来，乘着中国科学院知识创新工程的东风，长春光机所锐意改革，矢志创新，取得了一大批满足国家重大需求的成果，获得国家及省部级科技奖项70余项，为祖国国防事业发展和国民经济建设做出重要贡献。

At the beginning of the new century, CIOMP made active reforms and moved ahead under the auspices of CAS' s Knowledge Innovation Project. CIOMP has made many significant achievements and is thus contributing to the important needs of the country. Its work has been recognized both regionally and nationally, exemplified by the receipt of more than 70 awards. CIOMP has made significant and lasting contributions to the construction of China' s national defense and to the country' s economic growth.



## 半导体激光器

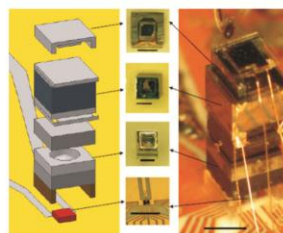
### Semiconductor Laser



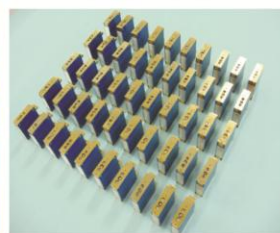
激光器外延片 (Laser wafer)



外延生长设备 (MOCVD)



低功耗芯片原子钟光源  
Low power consumption Chip-Scale Atomic Clock



无铅量子阱大功率半导体激光器  
High Power Al-Free Quantum Well Diode Laser



半导体激光焊接光源  
High-Power Diode Laser for Laser Welding



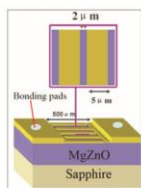
光谱合束半导体激光器  
Spectral Beam Combination of High-Power Diode Laser

## 光电探测器件

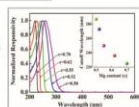
### Photoelectric Detection Device



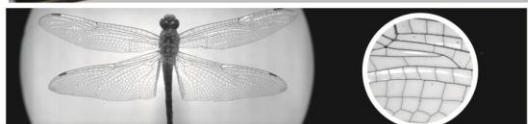
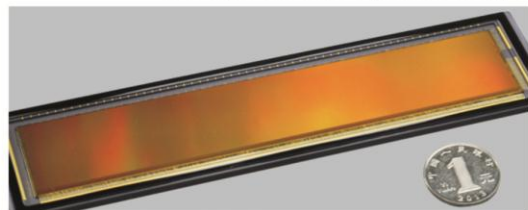
晶元检测实验室 Wafer test Lab



氧化锌基紫外探测器  
ZnO-Based UV  
Photodetectors

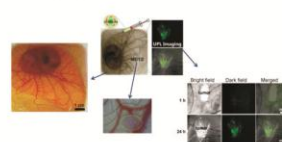
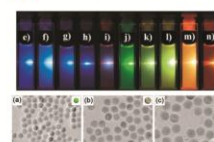


世界最高分辨率CMOS图像传感器-1.5亿像素  
World' s highest resolution CMOS image sensor with 150 megapixels

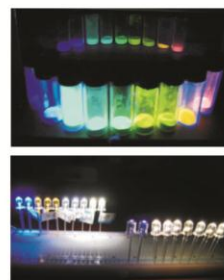


## 新型发光材料

### Novel Luminescent Material

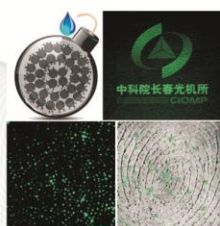


上转换纳米粒子的制备及其在鸡胚绒毛膜模型中对早期肿瘤（约为500微米）的标记  
Targeted labeling of an early-stage tumor spheroid in a chorioallantoic membrane model with upconversion nanoparticles



新型高效荧光粉  
New High-efficiency fluorescent powder

超碳点水触发“荧光纳米炸弹”  
Water triggered luminescent "nano-bombs"  
based on supra-carbon-nanodots

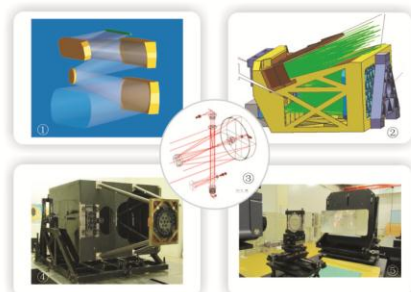




中国科学院长春光学精密机械与物理研究所  
CHANGCHUN INSTITUTE OF OPTICS, FINE MECHANICS  
AND PHYSICS, CHINESE ACADEMY OF SCIENCES

## 光学系统先进设计与制造

Advanced Design and Manufacturing of Optical System



- ① 离轴三反光学系统  
Off-axis TMA Optical System
- ② 自由曲面光学系统  
Free-form Surface Optical System
- ③ 多模多光复杂光学系统  
Multi-mode and multi-wavelength optical system
- ④ 离轴三反光学镜头  
Off-axis three mirrors optical system
- ⑤ CGH补偿检测自由曲面反射镜  
Compensating test for free-form mirrors with Computer-Generated Hologram



大口径碳化硅反射镜制造及配套设施  
Manufacture and machine for large S/C mirror

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## 自适应光学

Adaptive Optics



961单元压电变形反射镜及自适应光学系统  
961-element piezoelectric deformable mirror and adaptive optics systems



液晶自适应光学系统在1m量级光电望远镜中的应用效果  
Results of liquid crystal adaptive optics system on one meter telescope



国际空间站图像  
Image of International Space Station



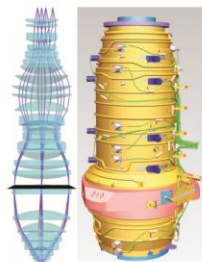
中国科学院长春光学精密机械与物理研究所  
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## 超精密光学

Ultra-precision Optics



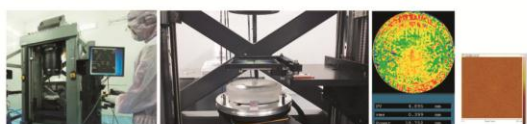
超精密光机系统设计/仿真分析实验室  
Ultra-precision optical system design and simulation analysis laboratory



纳米级小波像差光学投影物镜系统  
Lithographic projection system with nanoscale wave aberration



超精密光机系统加工装备  
Ultra-precision manufacturing equipments for optical and mechanical components



超精密光学元件及其检测结果, 面形精度最高达到0.5nm (RMS)  
High precision optical components, with up to 0.5nm RMS figure result

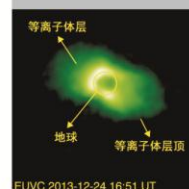
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## 空间紫外遥感

Space Ultraviolet Remote Sensing



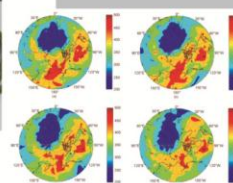
嫦娥三号极紫外相机  
CE-3 EUV Camera



EUVC 2013-12-24 16:51 UT  
地球等离子体层图像  
Image of Plasmas Layer of the Earth



风云三号紫外臭氧垂直廓线探测仪  
FY-3 UV Ozone Vertical Profile Sounder



仪器观测到2011年3月1日~4月5日北极地区臭氧低值事件发展全过程  
The instrument sounded the whole process of low level ozone in arctic: from 1/3/2011 to 5/4/2011





## 光栅制造

Manufacture of Diffraction Gratings



精密机械之王——大光栅刻划机  
The king of precision machine—grating ruling engine



刻划机高精度机械零件——大尺度、高精度涡轮，高精度丝杠  
High precision parts of ruling engine—large scale wheel and lead screw with high precision



全息曝光系统与全息光栅  
Exposure system for holography and holographic gratings

## 微光机电系统

MOEMS



各型微光谱仪  
Kinds of Micro Spectrometer

全血多指标微流控芯片分析系统  
Whole Blood and Multi-index  
Microfluidic Chip Analysis System

光纤生物传感器  
Optical Fiber Biosensor

声晶体传感器  
Phononic Crystal Sensor



## 光学工程

Optical Engineering

研制的各类光电装备广泛应用于载人航天、探月工程等国家重大型号任务。

Optoelectronic equipments developed by CIOMP has been applied to many national major projects such as the Manned Space Project, Chinese Lunar Exploration Program.

光电测控装备  
Optoelectronic measuring and controlling equipment



航天相机  
Space camera



航空相机  
Aerial camera



航空光电平台  
Airborne Optoelectronic Platform

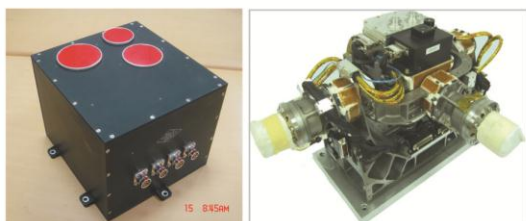


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## 光学工程 Optical Engineering



天宫一号超光谱成像仪  
TG-1 High Resolution Hyper-Spectral Imager



风云三号太阳辐射监测仪 Solar Irradiation Monitor on FY-3 satellite

## 实验室和工程中心 Laboratory and Engineering Center



科研成果  
R&D ACHIEVEMENTS

## 荣誉榜 HONORS

2000年以来,获得国家及省部级科技成果奖励70余项,其中国家科技进步特等奖1项、国家科技进步奖、国家发明奖、国家自然科学基金共14项。

Since 2000, CIOMP has received many awards including 70 national or regional awards. These include one National Special Award in Science and Technology Progress, and 15 National Scientific and Technological Progress Awards, State Natural Science Awards or State Technological Invention Awards.

