

航空宇航科学与技术博士后流动站

AERONAUTICAL AND ASTRONAUTICAL SCIENCE AND TECHNOLOGY POSTDOCTORAL FELLOWS PROGRAMME

西北工业大学航空宇航科学与技术博士后流动站是国家人事部 1989 年批准设立的博士后流动站之一，覆盖了飞行器设计、航空宇航制造工程、航空宇航推进理论与工程、人机与环境工程等 4 个博士学位授权学科和专业。该站有 3 个国家专业实验室，2 个国防科技重点实验室，1 个教育部重点实验室和 2 个工程研究中心，师资力量雄厚，教学科研条件良好，设站以来累计招收各类博士后研究人员 142 人。自建站以来，流动站取得了一系列重要研究成果，培养了一批优秀的博士后人员，是我国航空航天科技研究和高层次人才培养的重要基地。

The Aeronautical and Astronautical Science and Technology Postdoctoral Fellows Programme (AAST-PFP for short) of Northwestern Polytechnical University is one of the Postdoctoral Fellows Programmes establishing with national permission by Ministry of Personnel of the People's Republic of China (currently known as Ministry of Human Resources and Social Security of the People's Republic of China) in 1989, and covers 4 Ph. D authorized subjects and majors which are: Flight Vehicle Design, Aeronautical and Astronautical Manufacturing Engineering, Aeronautical and Astronautical Manufacturing Engineering, Aeronautical and Astronautical Theory and Engineering, Man-Machine and Environmental Engineering. AAST-PFP owns 3 national specialized laboratories, 2 key laboratories for national defense science and technology, 1 key lab of Ministry of Education and 2 engineering research centers therefore has powerful teaching resources and excellent conditions on teaching scientific research. Since the founding, AAST-PFP has totally recruited 142 postdoctoral researchers of all kinds and has achieved a series of significant researching results, while also raising a batch of excellent postdoctoral personnel. It is an important base for raising high-level talents in the field of aeronautical and astronautical science and technology in our country.

一、 科研项目

I. Scientific Research Project

自 2005 年以来，该站博士后参与国家级项目 23 项，参与省（部）级项目 70 余项；获国家级自然科学基金 10 余项，获中国博士后科学基金、省（部）级博士后科学基金 20 余项。相关经费达到 4000 万元以上。

Since 2005, the postdoctoral fellows have participated in 23 national-level projects, and have participated in more than 70 projects of province (ministry) level; have received more than 10 national-level natural science funds; received more than 20 postdoctoral science fund of national and province (ministry) level. The total amount of funds the station received reached more than 40 million.

在此期间，所发表的论文被 SCI 收录 46 篇，EI 收录 100 多篇，ISTP 收录 8 篇；获专利授权 8 项，申请专利 25 项，专利受理 28 项。

During this period of time, 46 of the theses published by the team members have been collected by SCI, and more than 100 theses are collected by EI, 8 are included by ISTP; 8 patents were licensed, 25 patents were applied, and 28 patents were accepted.

该站教职工科研实力雄厚，承担了多项国家自然科学基金和省部级科学基金项目，基础研究领域有较高水平。在国家 973 计划、863 计划、国防基础预研等领域成绩突出，在国家重大科研任务中承担了大量的研究、开发和研制任务，具备承担国家重点型号研制任务的雄厚实力。近几年来有 1 项国家科技进步二等奖，1 项国家教学成果二等奖，真正的研究经费（不计研制保障条件和型号研制费用）我校该学科的经费最多，重大项目数也最多；出版专著、教材 11 部，发表论文 500 余篇；培养出了像“空军十大杰出青年”李航航、“枭龙”常务副总设计师顾伟等一批科技精英。

AAST-PFP teaching staff are with strong scientific and technological research capabilities, and has undertaken multiple projects of national natural science funds and province or ministry level natural science funds, and the team has a quite high level in basic research fields. AAST-PFP has made excellent achievements in several fields such as national 973 plan, 863 plan and basic beforehand research of national defense. It also undertakes a big amount of researching, developing and manufacturing tasks in National Science and Technology Major Project, and possesses the strong capacity to take on the R&D objectives for national critical models. In recent years, we received 1 second prize of National Scientific and Technological Progress Award, and 1 second prize of National Teaching Achievement Award, and regarding the real research grant (not include R&D guarantee condition and model research grants), this major of our university has received the highest grant, and we

have the highest number of major programs; we published 11 monographs and teaching materials, released more than 500 theses; we raised a batch of scientific and technological elite such as “Top Ten Prominent Youth of Air Force” Li Hanghang, and permanent deputy chief designer of “Thunder Dragon” Gu Wei.

二、 科研条件

II . Research Platforms

初步建成了“飞行器敏捷设计技术实验室”。目前该实验室拥有飞行器多学科综合设计实验室、新概念复合升力体飞行器综合设计实验室、飞行器动力学与控制实验室、飞机综合设计地面仿真实验室、飞行器运动机构及可靠性实验室以及从九五开始投资建设的重点学科实验室等，拥有先进的大型飞机(含大型客机和大型运输机)及未来战斗机新布局综合研究实验平台、临近空间飞行器螺旋桨电推进系统实验平台、复合升力体新概念飞行器综合设计实验平台、微型飞行器气动测试平台；系统设计与集成实验平台、虚拟样机与仿真实验平台、新概念飞行器综合设计实验平台等。另外还拥有研究生与本科生科技创新实验室等。这些实验设备已经在大型飞机与未来战斗机、新概念无人飞行器等研制方面发挥了很大的作用。

AAST-PFP initially builds up “Flight Vehicle Agile Design Lab”. At present, the lab has lab of flight vehicle multidisciplinary comprehensive design, comprehensive design lab of new concept composite lifting-body aircraft, lab of flight vehicle dynamic and control, comprehensive design ground simulation lab for flight vehicle, flight vehicle kinematic mechanism and reliability lab, and key discipline laboratories which has been established since 1995 etc., therefore AAST-PFP possesses several advanced platforms including comprehensive research and experimental platform of new layout on large aircraft (including big airliner and giant transport aircraft) as well as future fighter aircraft, experimental platform of screw propeller electric propulsion system on near-space flight vehicle, experimental platform of composite lifting-body new concept comprehensive design, micro air vehicle pneumatic testing platform; system design and integration experimental platform, virtual prototype and simulation experimental platform and new concept flight vehicle comprehensive design experimental platform etc. Besides, we have scientific innovation lab for postgraduate and undergraduate etc. All these experiment equipment have played an important role on the development of large aircraft, future fighter aircraft and new concept

unmanned aerial vehicle.

流动站为博士后人员构建了先进的科学研究平台和试验环境,拥有跨音速平面叶栅风洞、对转压气机试验台、双级轴流压气机试验台、旋转机械故障诊断、涡喷发动机试车台、发动机各种附件、脉冲爆震波、超燃冲压发动机燃烧室、SAJO12000 五坐标加工中心、五轴四联动精密电火花机床等大型试验设备;PIV 三维粒子图像测速仪、热成像仪、热线风速仪、电子压力扫描阀、信号数据采集仪、多通道振动信号分析仪等上百个(台)先进的测试仪器;自主研发的大型整体叶盘线性摩擦焊接装备、涡轮叶片锥束 CT 扫描装置与无损测量分析系统、微小零件金属液滴喷射成形实验装置等设备,以及 Teamcenter Engineering/Enterprise PLM/PDM 系统,UG NX、CATIA、Pro/E 等高端 CAD/CAM 集成软件, Surface、ProCast、MSC/Nastran、Cutpro、Delmia、Tecnomatix 等工程分析与仿真软件。

AAST-PFP has created an advanced scientific research platform and experiment environment for postdoctoral fellows, and owns large equipment such as transonic speed planar cascade tunnel, counter-rotating compressor test-bed, double-stage axial flow compressor test-bed, rotating machinery trouble diagnosis, turbojet engine test bench, all kinds of engine accessories, pulse detonations, scramjet combustion chamber, SAJO12000 five-axis machining center and five-axis four-linkage precision EDM machine etc.; hundreds of advanced testing device including: 3D PIV thermal imager, hot wire anemometer, electronic pressure scanner valve, signal data acquisition instrument and multichannel vibration signal analyzer etc.; self-developed equipment such as large-scale blisk linear friction welding device, turbine blade cone-beam CT scanning device and non-invasive measuring analyze system, micro parts molten droplet ejection forming experiment unit etc., as well as Teamcenter Engineering/Enterprise PLM/PDM system, advanced CAD/CAM integrated software like UG NX, CATIA and Pro/E; engineering analyze and simulation software such as Surface, ProCast, MSC/Nastran, Cutpro, Delmia and Tecnomatix.

流动站积极推行产学研相结合的博士后培养模式,切实加强博士后实践能力的培养。例如,流动站已经与世界著名航空发动机研制单位建立了科研合作关系,联合成立了“中俄联合适航性研究中心”(与俄罗斯中央航空发动机研究院合作)、“中德旋转机械与风能装置测控研究所”(与柏林工业大学合作)、“中英传热与空气动力学实验室”(与英国罗罗公司、牛津大学合作)等研究机构,每年双方互派留学生和访问学者,进行人才培养和学术交流。

AAST-PFP actively implements the integration of manufacturing, studying and research as the postdoctor raising model, which has effectively reinforced the practical ability of the postdoctoral fellows. For example, AAST-PFP has established scientific and research cooperative relationship with world famous aeroengine development establishments, and jointly sets up research institutes like “Sino-Russia Joint Airworthiness Research Center” (works with Central Institute of Aviation Motors of Russia), “Sino-German Institution of Monitoring and Control for Rotating Machinery and Wind Turbines” (cooperates with Technical University of Berlin), “Sino-British Laboratory of Thermal Transmission Aerodynamic” (cooperates with Rolls-Royce Ltd. and University of Oxford). Each year both parties will send overseas students and visiting scholars to carry out personnel training and academic exchange.

三、学术队伍及带头人

III. Academic Team and Lead Researchers

本站拥有一支学术思想活跃、年龄结构合理、综合素质优良的实力雄厚的学术队伍。共有教授 24 人 (博导 14 人)、副教授 66 人。其中 2 位长江学者 (宋笔锋、高正红)、1 位教育部新世纪优秀人才 (吕震宙)、2 位教育部新世纪优秀人才 (祝小平, 周州)、1 位总装飞机专业组专家、1 位总装无人机专业组委员、1 位总装 863 专家组成员。

AAST-PFP owns an enormously strong academic team with active academic thoughts, balanced age structure and remarkable capability. There are 24 professors (14 of them are Ph. D supervisors), 66 associate professors. 2 of the team members are “Chang Jiang Scholars” (Song Bifeng, Gao Zhenghong), 1 New Century Excellent Talent of Ministry of Education (Lv Zhenzhou), and 2 New Century Excellent Talent of Ministry of Education (Zhu Xiaoping, Zhou Zhou), 1 specialist in aircraft assembly specialized group, 1 committee member of drone assembly specialized group, and 1 member of the expert group in assembly 863.

四、招收计划

IV. Enrollment Programme

与企业及科研院所的合作主要有一飞院、611 所、西飞、商飞、部队等。2010 年计划招收博士后研究人员 15-20 人。

The cooperation involving with corporations and scientific research institution includes AVIC the First Aircraft Institute, AVIC Chengdu Aircraft & Research Institute, AVIC Xi'an Aircraft Industry (Group) Company Ltd, Commercial Aircraft Corporation of China Ltd and military service. It is planned to recruit 15-20 postdoctoral fellows in 2010.