TU NEM

TSINGHUA UNIVERSITY

INTERNATIONAL MASTER'S PROGRAM IN NUCLEAR ENGINEERING AND MANAGEMENT

清华大学核电工程与管理国际人才培养
专业硕士学位项目

2023

清華大學 Tsinghua University | 中国核工业集团有限公司 China National Nuclear Corporation | 国家电投 SPIC | 中广核 CGN

1.1

OVERVIEW OF TUNEM

项目概览

TUNEM is a 2-year professional master's degree program, which is tremendously supported by the National Energy Administration of China and the Ministry of Education of China with full Chinese Government Scholarship. Meanwhile, the three major nuclear power groups in China, i.e. China National Nuclear Corporation (CNNC), State Power Investment Corporation (SPIC) and China General Nuclear Power Corporation (CGN), also provide great support. Every year TUNEM admits 30 applicants with outstanding academics and global vision in the field of nuclear engineering and management, who are willing to further their studies in China and to make contributions to the cooperation between China and their motherlands.

清华大学核电工程与管理国际人才培养专业硕士学位项目由中国国家能源局和中国教育部支持，并提供全额中国政府奖学金，学制一般为 2 年。同时，中国核工业集团有限公司、国家电力投资集团有限公司、中国广核集团有限公司三大核电集团给予大力支持。该项目每年录取 30 名在核能与核技术工程领域具有职业素养和国际视野、渴望在华深造并愿为中国与其母国的友好合作与发展做出贡献的高层次专门人才。

1.2

PROFESSIONAL COURSES OFFERED IN ENGLISH

专业课程英文授课

The curriculum includes Chinese language and culture, ethics in nuclear engineering, professional courses in nuclear engineering and management, professional practice and academic activities. The program provides a comprehensive professional education and research opportunity in the field of nuclear engineering including thermodynamics, heat transfer, fluid flow, electrical science, chemical engineering, material science, mechanical science, nuclear physics, reactor theory, fuel cycling, radiation protection, and so on.

The courses are scheduled to permit either intensive study in a single field or interdisciplinary study between fields. Comprehensive introductory courses are given to provide a common basis of understanding for those students of dissimilar backgrounds. Professional courses are selected in consultation with the graduate coordinator or a faculty advisor to meet his/her academic and career goals. Internship opportunities are designed for students to gain professional experiences in companies of nuclear industry in China.

学生需完成中国语言、文化课、工程伦理课、专业课、实习和各种学术活动。该项目计划在核工程研究领域提供全面的专业教育，包括热力学、传热学、流体力学、电气科学、化学工程、材料科学、机械科学、核物理、反应堆理论、核燃料循环和辐射防护。

课程允许单一学科或跨学科领域之间的交叉选修。综合概论课程适合不同背景的学生对本专业有总体了解。专业课程的选择在教师指导下进行，以适合未来课题的研究和职业发展。为培养专业实践能力，学生将有在中国核电企业内实习的机会。

> *The study duration of the program is generally 2 years.*
>
> *该项目学习期限一般为 2 年。*

1.3

PROFESSIONAL PRACTICE

专业实践

Based on the plan, the two-year master program offers half-year professional practice, During which student will design and conduct scientific survey on China-specific issues with the guidance of supervisors. A diverse number of practice opportunities are available in nuclear industry companies of CNNC, SPIC and CGN. During the on-spot survey, students will be exposed to methods and techniques used by natural and social scientists to identify, analyze and interpret nuclear engineering problems. The on-spot survey will be in Beijing or in other parts of China, and is usually conducted from the beginning of the second academic year.

在两年硕士期间，学生必须完成不少于半年的专业实践环节。学生将在导师的帮助下，设计并完成富有中国特色的项目调查研究。中核集团、国家电投或中广核提供了大量的实践机会。在现场调查过程中，学生有机会接触到科学家用先进的方法和技术来识别、分析和解释核工程问题。实习将安排在北京或其他省市，通常在第二学年初开始进行。

1.4

THESIS

论文

Students will conduct an independent research project which will be supervised by a faculty member of Tsinghua University and a senior researcher of CNNC, SPIC or CGN. The research topic comes from the actual project. A thesis topic selection plan and a topic selection report are required in the second term.Students will submit a thesis in English with an abstract in Chinese or a thesis in Chinese. The final thesis defense is required.

学生由清华大学教师和来自中核集团、国家电投或中广核的专家作为联合导师指导进行独立的项目研究。研究课题来自于实际项目，要求在第二学期完成书面的选题计划和正式的选题报告。学生在毕业前要求提交由英文撰写的论文并附上详细中文摘要，或提交中文论文，并完成最终论文答辩。

2.1

TSINGHUA UNIVERSITY

清华大学

Tsinghua University was founded in 1911 with an international program to help Chinese students to study abroad. Based on the favorable academic atmosphere and leaning environment, it has become one of the world leading universities.

Today, it is one of the most attractive universities in the world, rooted in the rich cultural background. It has become a bridge of international science and technology, education and cultural exchanges, the cradle of training elite leaders, the trustworthy partner of numerous research experts and scholars.

清华大学始建于 1911 年，自成立以来，有一大批国际项目支持学生去国外学习，得益于其良好的学术氛围和学术环境，已发展成世界著名高等学府之一。

清华大学作为当今世界最具吸引力的大学之一，根植于其丰富的文化底蕴，它已成为国际科技、教育和文化交流的桥梁，是培养精英领袖的摇篮，更是无数科研专家、学者值得信赖的合作伙伴。

The reemergence of China as an economic, scientific and cultural powerhouse has shifted the dynamics of global learning, presenting the world's best and brightest with unprecedented opportunities for advancing human knowledge in partnership with Chinese thinkers and researchers. In this world, institutions of higher education are engines of collaborative teaching and learning. That is why Tsinghua University is evolving, advancing and expanding.

The 21st century requires problem solvers with broad perspectives and international outlook. Success is no longer just about being the smartest, honing your expertise in a single area and looking at problems within your field of vision. Interconnectedness is a new reality.

https://www.tsinghua.edu.cn/en/

中国经济、科学、文化的崛起为世界树立典范，也为我国的高端人才提供前所未有的机遇。当今世界，高等学府作为合作办学的载体，也推动了清华大学的演变、发展和进步。

21 世纪迫切需要具备广阔视角和国际视野的人才，以解决人类面对的各种问题。成功不再只是在某个领域成为专家，互通互联是当今的新形势。

The global challenges we face require strategic cooperation, mutual understanding, and leadership built upon hands-on experience.

全球化挑战下需要我们加强战略合作、共同认知以及实践领导力。

AMONG THE TOP RESEARCH UNIVERSITIES IN THE WORLD

Tsinghua has been recognized as one of the top universities in the world. It is ranked:

16th
in the world (1st in Asia) ,
by Times Higher Education World University Rankings 2023

17th
in the world (1st in China),
by QS World University Rankings 2022

23th
in the world (1st in Asia),
by U.S.News & World Report Best Global Universities Rankings 2023

26th
in the world (1st in China),
by Academic Ranking of World Universities 2022

10th
in the world (1st in Asia),
by Times Higher Education World Reputation Rankings 2021

6th
in the world (1st in Asia),
by QS Graduate Employability Rankings 2022

The campus, set in former imperial gardens of the Qing Dynasty, is home to over 40,000 students drawn from 130 countries. Tsinghua offers a friendly and welcoming community where students can get involved in their favorite activities and try new ones. Students can choose from associations of the university and activities, such as sports competition, community service, New Year's party, tourist visits to Chinese cultural and historic sites, concerts etc..

Students are encouraged to participate in various extracurricular activities, so that they can achieve a well-rounded development.

For details about Tsinghua University, please visit
https://www.tsinghua.edu.cn/en/

清华大学坐落于北京西北郊风景秀丽的清华园—清朝的皇室花园，吸引了来自全世界近 130 个国家超过 4 万名学生学习。清华校园生活丰富多彩，社团蓬勃发展，百花齐放，每年组织各种活动如运动会、社区服务、新年晚会、历史文化遗址参观、音乐会等，学生可以根据自己的喜好参加。

学校鼓励学生参加各种课外活动，促进学生全面发展，详情请参阅链接：http://www.tsinghua.edu.cn/

2.2

DEPARTMENT OF ENGINEERING PHYSICS

工程物理系

The Department of Engineering Physics (DEP) was founded in 1956 and has been committed to our mission to provide advanced education of science and engineering for talented students in atomic energy science and technology in China.

Whilst undergoing constant reform and innovation, and throughout striving to cultivate high-quality staff and students with world-wide vision and impact. Currently, the number of undergraduates and postgraduates is almost 600 and 800 respectively. Meanwhile, DEP is home to 106 faculty members, among whom 38 have earned professorship and 60 with associate professorship

DEP consists of six research institutes, which are Institute of Nuclear Technology and Application, Institute of Technical Physics, Institute of Nuclear Energy Science and Engineering Management, Institute of Safety Science and Technology, Institute of Medical Physics and Engineering and the Institute of Modern Physics. DEP covers three first-level disciplines, which are Nuclear Science and Technology, Safety Science and Engineering and Physics. Nuclear Science and Technology is one of the most respected and dominant disciplines in Tsinghua University, which has been ranked No.1 in the national first-level discipline evaluation in 2003, 2008 and 2013, and was rated A+ in the fourth national first-level discipline evaluation in 2017.

DEP ranks among the top in the world, it is continuously cultivating and delivering high-level talents for the national nuclear strategy and safety. Focusing on national strategic needs and major scientific and technological issues, it has the ability to undertake major projects. Cooperation of government, industry, and university and research application has been cultivating emerging industries in public security. Also, the Department strive for major national scientific and technological awards, and maintaining the leading position of domestic disciplines. Hence, DEP has formed outstanding advantages.

DEP adheres to independent innovation, has undertaken a large number of major and key projects, built a number of world-class scientific platforms, and has obtained a series of major scientific research results and scientific and technological awards. In the past two decades, the Department of Engineering Physics has been awarded more than 20 scientific and technological awards at all levels as the first completion unit (department).

DEP has established a number of scientific research facilities and platforms, such as China JinPing underground Laboratory (CJPL), China Dark Matter Experiment (CDEX), Sino-UNIted Spherical Tokamak (SUNIST), Isotope Separation, Tsinghua Thomson-scattering X-ray source (TTX), Compact Pulsed Hadron Source (CPHS), etc. Our faculty members have participated in international collaborations on fundamental research, including the Large Hadron Collider beauty (LHCb) Experiment, Daya Bay Reactor Neutrino Experiment, Super-Kamiokande Experiment, and STAR Experiment at the Relativistic Heavy Ion Collider (RHIC).

工程物理系成立于 1956 年，是为了培养理工结合的新型人才，开创和发展我国的原子能科学技术而成立的。

工程物理系不断改革创新，以培养输送大批高素质、高质量、具有国际化视野的核领域卓越人才为目标。在校本科生和研究生分别为近 600 人和近 800 人。工程物理系在编教职工 106 人，其中，具有正高级职称 38 人，副高级职称 60 人。

工程物理系设有核技术及应用、技术物理、核能科学与工程管理、安全科学与技术、医学物理与工程、近代物理 6 个研究所。覆盖核科学与技术、安全科学与工程、物理学 3 个一级学科。其中，核科学与技术一级学科是清华大学的传统和优势学科，2003、2008、2013 年连续三次在全国一级学科评估中排名第一，2017 年第四次全国一级学科评估等级为 A+。

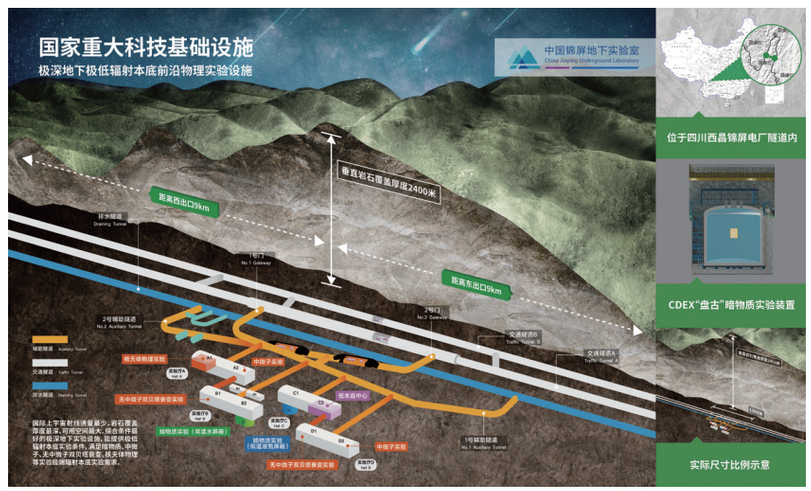
工程物理系学科总体水平居世界前列，在为国家核战略安全持续培养输送高端人才、围绕国家战略需要与重大科技问题承担重大项目能力、政产学研用合作培育公共安全新兴产业、争取国家重大科技奖励、保持国内学科引领地位方面，已经形成突出优势。

工程物理系坚持自主创新，承担了大量重大、重点项目，建设了一批世界一流的科学平台，取得了一系列重大科研成果和科技奖励，近二十年来，工程物理系以第一完成单位荣获各级各类科技奖励 20 余项。

工程物理系建设了一系列科研设施与科研平台，包括中国锦屏地下实验室（CJPL），中国暗物质实验合作组（CDEX），中国联合球形托克马克（SUNIST），同位素分离，清华汤姆逊散射 X 射线源 （TTX），微型脉冲强子源（CPHS）等。参与了多项基础研究的国际合作，包括大型强子对撞（LHCb）实验，大亚湾中微子实验，超级神冈级实验和 STAR 相对论重离子对撞机（RHIC）实验。

Nuclear Science and Technology is one of the most respected and dominant disciplines in Tsinghua University, which has been ranked No.1 in the national first-level discipline evaluation in 2003, 2008 and 2013, and was rated A+ in the fourth national first-level discipline evaluation in 2017.

核科学与技术一级学科是清华大学的传统和优势学科，2003、2008、2013 年连续三次在全国一级学科评估中排名第一，2017 年第四次全国一级学科评估等级为 A+。



2.3

INSTITUTE OF NUCLEAR AND NEW ENERGY TECHNOLOGY

核能与新能源技术研究院

Established in 1960, the Institute of Nuclear and New Energy Technology (INET) has developed into one of the renowned research and design institutions in the world.

INET had made substantial contribution to the early development of China's nuclear program in 1960s, i.e. the self-designed Shielding Test Reactor in 1964.

INET greets its soliddevelopment stage with a dozen key programs in 1980s, including the 5 MW Nuclear Heating Reactor (NHR-5), the TRPO Process for partitioning of high-level liquid waste (HLW), the Cobalt-60 Container Inspection System, and the 10 MW High Temperature gas-cooled Reactor (HTR-10).

In 2006, INET was approved to lead the demonstration nuclear power plant project equipped with High Temperature Gas-cooled Reactor Pebble-bed Module (HTR-PM). HTR-PM is going to be the first commercial-scale nuclear power plant of modular High Temperature Gas-cooled Reactor (HTGR) in the world as it has realized the first connection to the grid in 2021.

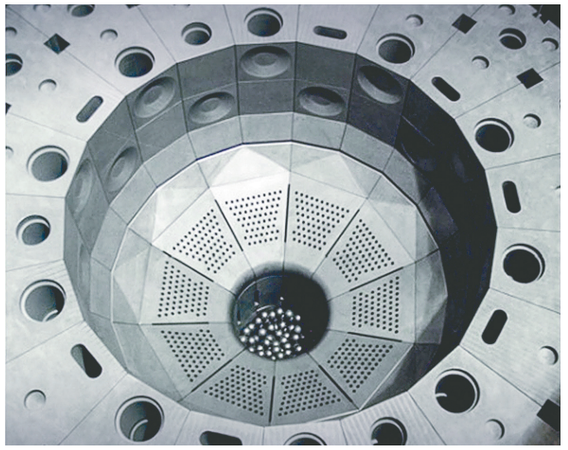
A number of high-level research facilities and platforms have been operated at INET, including 3 experimental reactors. INET is home to two world-class laboratories.

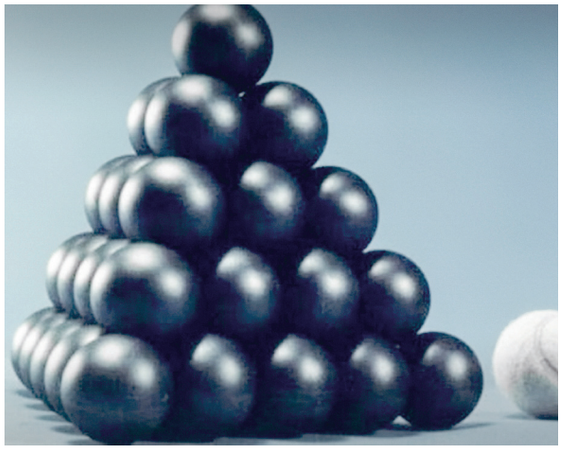
核能与新能源技术研究院始建于 1960 年，现已发展成为世界著名的研究设计院。

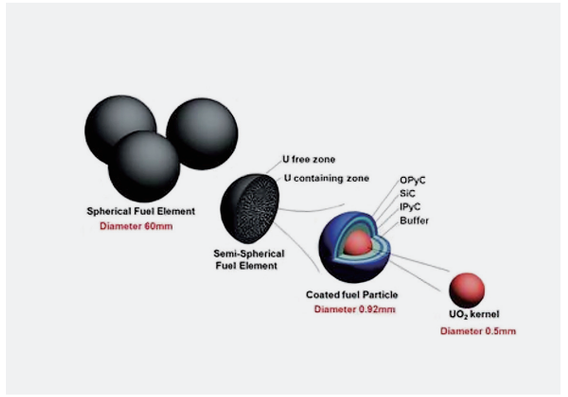
1964 年，核研院建成了自主研发的屏蔽试验反应堆，为我国早期核能事业的发展做出了重要贡献。

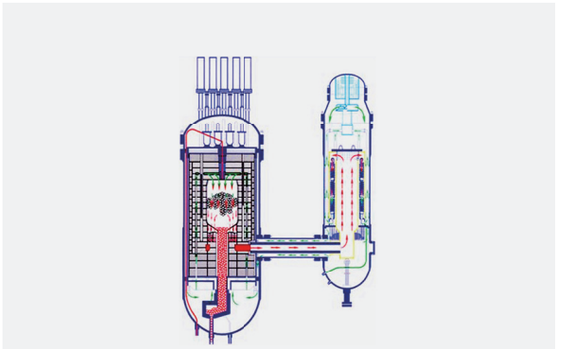
在 80 年代，核研院设计研发的一批关键项目进入蓬勃发展的阶段，其中包括 5 兆瓦低温核供热试验反应堆项目(NHR-5)、用于高放废液分离的 TRPO 工艺（HLW）、钴 -60 集装箱检查系统和 10 兆瓦高温气冷堆（HTR-10）项目。

> *Nowadays, INET has been making efforts to meet the needs of national economy to develop itself into a world-class R&D base.*
>
> *当前，核研院致力于满足国家经济发展的需要，争取成为世界级研发机构。*









INET is more than a research base. It has made great accomplishments in post-graduate education and continuing education. INET has established partnerships with many international institutions and has relationships with colleagues worldwide.

Along with the pace of Tsinghua University marching to a world-class university, INET envisions the actions to build a world-class research institute, featuring interdisciplinary and comprehensive high-tech in the field of nuclear and new energy.

能源政策
fields of energy policy

技术评估
technology evaluation

新能源
new energy technology

2006 年核研院被批准牵头设计研发高温气冷堆示范工程项目（HTR-PM）。高温气冷堆示范工程是全球首座将模块化高温气冷堆技术成功商业化的示范项目，并于 2021 实现首次并网。

核研院拥有许多高水平的研究设施和研究平台，包括 3 个实验反应堆，同时拥有两个世界级实验室。

核研院不仅是科研基地，也是人才培养基地，在研究生培养，继续教育等方面都取得了骄人的成绩。核研院与许多国际机构和同行建立了良好的伙伴关系。

核研院将随着清华大学迈向世界一流大学的步伐，建设成为一所以核能和新能源领域的跨学科综合高科技为特色的世界一流的研究院。

SUPPORTERS

3.1

SCHOLARSHIP

奖学金

THE CHINESE GOVERNMENT SCHOLARSHIP
中国政府奖学金

The Chinese Government Scholarship (CGS) is set up by the Chinese government to sponsor international students, teachers and scholars to study and conduct research in Chinese universities, which aims to promote the mutual understanding, cooperation and exchange in various fields between China and other countries. CGS-TUNEM Program is co-established by the Ministry of Education of P.R. China and the National Energy Administration to support students enrolled by TUNEM. This full scholarship includes tuition, on-campus lodging, stipend and comprehensive medical insurance.

中国政府奖学金由中国政府设立，用于资助世界各国优秀学生、教师、学者到中国的大学学习或开展研究，旨在增进中国人民与世界各国人民的了解和友谊，发展中国与世界各国在各领域的交流与合作。中国政府核电奖学金项目由中国教育部和国家能源局联合设立，旨在资助清华大学核电工程与管理国际人才培养专业硕士学位项目学生。此奖学金为全额奖学金，包含学费、住宿费、生活费和综合医疗保险费。

CGS COVERAGE
资助内容

Total for two years	￥206,800-248,400
The Full CGS includes:	
Tuition fees	￥78,000
Accommodation	On-campus ￥80/day Off-campus allowance ￥700/month
Living allowance	￥108,000
Comprehensive medical insurance	￥4,000

两年总计	￥206,800-248,400
全额奖学金包含	
学费	￥78,000
住宿费	在校住宿￥80/ 天 校外住宿补贴￥700/ 月
生活费	￥108,000
综合医疗保险费	￥4,000

*¥100 equals to $13.8 with current exchange rate.

DURATION OF CGS
资助时长

2 Years / 2 年

NUMBER OF WINNERS
资助人数

30 Winners / 30 人

CGS APPLICATION PROCEDURE
申请流程

1. Applicants should complete the Online Application on the website of the THU Graduate Programs Application System for International Students and be pre-admitted by the Program. Website: https://yz.tsinghua.edu.cn/en/
2. Applicants should complete the CGS scholarship Application on the website of the China Scholarship Council (CSC). Website: http://www.campuschina.org
3. Tsinghua University examines the scholarship application and nominates to CSC.
4. CSC examines and approves the scholarship application.

1. 报考核电工程与管理国际人才培养专业硕士学位项目，并被院系拟录取。报考网址：https://yz.tsinghua.edu.cn/en/
2. 申请人登录国家留学基金委，按要求完成奖学金在线申请，网址：http://www.campuschina.org；
3. 清华大学审核奖学金申请，并上报国家留学基金委；
4. 国家留学基金委审批。

IAEA MARIE SKLODOWSKA-CURIE FELLOWSHIP PROGRAMME
IAEA 玛丽居里奖学金

Named after pioneer physicist and twice Nobel Prize laureate Marie Sklodowska-Curie, the Marie Sklodowska-Curie Fellowship Programme (MSCFP) aims to inspire and encourage young women to pursue a career in the nuclear field, by providing highly motivated female students with scholarships for Master's programmes and an opportunity to pursue an internship facilitated by the IAEA for up to 12 months, supporting an inclusive workforce of both men and women who contribute to and drive global scientific and technological innovation. Scholarships are awarded annually, with 150 female students selected per year.

Every year, China contributes 10 seats to MSCFP for international female students who pursue their master study in China. TUNEM is authorized to nominate its students to MSCFP. Five TUNEM students have been granted the MSCFP scholarship for 2022 intake.

Having been granted the Chinese Government Scholarship, TUNEM students who receive the MSCFP scholarship will not get extra financial support from the IAEA, but opportunities to pursue an internship facilitated by the IAEA for up to 12 months.

玛丽亚·斯克沃多夫斯卡·居里奖学金项目 (MSCFP) 以先驱物理学家、两次诺贝尔奖获得者玛丽·居里命名。旨在鼓励和支持年轻女性从事核领域的工作，为优秀的女性硕士研究生提供奖学金和在国际原子能机构长达一年的实习机会。通过此方式，来支持和发展具有性别包容性的人才队伍，推动和贡献全球科技创新。每年，该奖学金面向全球提供约 150 个名额。

每学年，中国政府为在中国学习的国际女性硕士研究生提供 10 个玛丽居里奖学金名额。TUNEM 项目具有玛丽居里奖学金提名资格，2022 年，项目提名 5 位学生，均成功获得玛丽居里奖学金。

获得玛丽居里奖学金的 TUNEM 项目学生，因为已获得了中国政府奖学金，所以不会额外获得 IAEA 的资助，但可以获得由 IAEA 支持的一年实习机会。

3.2

CHINA NATIONAL NUCLEAR CORPORATION

中国核工业集团公司

http://en.cnnc.com.cn/

China National Nuclear Corporation (CNNC) is a state-owned key enterprise, with an asset of about RMB 1.025 trillion, and a staff of about 150 thousand employees. CNNC owns 12 holding Public Companies, about 800 member units including enterprises and institutions of all kinds at all levels. Among them, there are 53,300 professional technical experts and 17 academicians from Chinese Academy of Sciences and Chinese Academy of Engineering.

As the main body for China's national nuclear industry, CNNC has established a complete industrial system of nuclear science and technology, serving as the major driving force of nuclear power and construction in China.

CNNC is mainly engaged in the scientific R&D, design, construction, production and operation in the fields of nuclear power, nuclear fuel cycle, nuclear technology application, nuclear environmental protection project, as well as foreign economic cooperation, and import and export business. It is currently the major investor for most nuclear power plants in operation and under construction in China, the mainstay for the development of nuclear power technologies, the most important nuclear power design and EPC contractor, nuclear power operation and technical service provider, and nuclear power plant exporter. It is the exclusive supplier of nuclear fuel cycle in China, the professional force of nuclear environmental protection project, and the backbone of nuclear technology application. Its business scope covers the whole industrial chain ranging from uranium exploration, mining, fuel production through reprocessing, as well as renewable energies. It is the only company in China with a complete industrial system of nuclear industry.

中国核工业集团有限公司（简称中核集团）是国有重要骨干企业，资产规模约 1.025 万亿元，员工约 15 万人，其中专业技术人才达 5.33 万人，中国科学院、工程院院士 17 人，下属 12 家上市公司，各级各类企事业成员单位约 800 家。

中核集团作为国家核科技工业的主体，拥有完整的核科技工业体系，是国家核能发展与核电建设的主力军。

中核集团主要从事核电、核燃料循环、核技术应用、核环保工程等领域的科研开发、设计、建造和生产经营，以及对外经济合作和进出口业务，是目前国内投运和在建核电的主要投资方、核电技术开发主体、最重要的核电设计及工程总承包商、核电运行技术服务商和核电站出口商，是国内核燃料循环专营供应商、核环保工程专业力量和核技术应用骨干，业务覆盖从铀矿勘探、开采、燃料制造、到后处理、可再生能源等全产业链，是中国唯一拥有完整核工业产业体系的集团公司。

The China National Nuclear Corporation (CNNC) is a large State-owned enterprise under direct management by the central government. It successfully built the first nuclear power plant in the Chinese mainland.

中国核工业集团公司是经国务院批准组建的特大型国有独资企业，成功建成我国大陆第一座核电站。

CNNC has 6 national key laboratories, 23 research institutes, 1 national engineering technology center, 21 key laboratories, 12 national and ministerial R&D platforms, 14 engineering technology centers, 3 ministry level R&D platforms.

As China's only enterprise which has achieved bulk exports of nuclear power plants, CNNC has already exported 7 nuclear power units and 8 reactors to 7 countries. CNNC is one of the stake holders of Rossing uranium mine (Namibia), the world's fourth biggest uranium producer. CNNC has established trade relations with more than 50 countries, negotiating for cooperation in nuclear power, uranium resources, nuclear fuel, application of nuclear technology, etc.

CNNC has signed the commercial contract with Pakistan for C-5 project, framework agreement on pressurized water reactor NPP with Argentina, contract of comprehensive cooperation on nuclear energy with France, contract on cooperation for construction of nuclear energy research and innovation center with Britain, as well as framework agreement with Sudan. Besides, CNNC has been deepening nuclear cooperation with Saudi Arabia, Bulgaria, Jordan and Algeria among others.

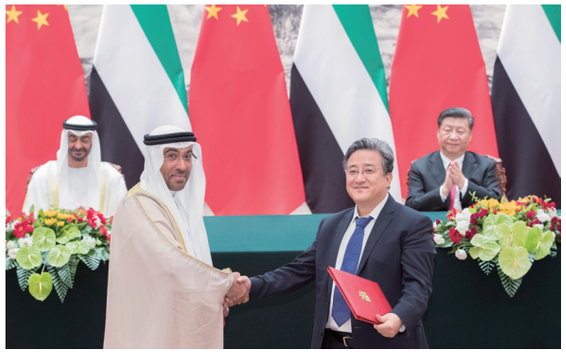
CNNC's nuclear technology application extends to isotopes and related products, nuclear medicine, nuclear instruments and apparatus, radioactive sources and industrial applications, as well as irradiation processing. CNNC accounts for a market share of 70% in the area of radioactive medicine in China. CNNC is the only Chinese company that produces radioactive sources for medical purposes.

中核集团围绕产业链布局创新链，每个重要生产环节均有科技平台支撑，具备体系完整的核科技研发平台，其中包括 6 个国家级重点实验室，23 家集团公司内部科研院所，1 个国家级工程技术中心，21 个集团公司重点实验室，12 个国家级研发平台，14 个集团级工程技术研究中心，3 个部委级科研平台。

中核集团是中国唯一出口过核电站并实现批量出口的企业，已成功向 7 个国家出口过 7 台核电机组、8 台反应堆或核动力装置，正式控股世界第四大产能铀矿——纳米比亚罗辛铀矿山，并与全球 50 多个国家和地区建立了科技经贸关系，正在商谈核电及铀资源、核燃料、核技术应用等核工业全产业链合作。

中核集团已与巴基斯坦签署 C-5 项目商务合同，与阿根廷核电公司签署阿根廷压水堆核电站框架合同，与法国签署核能全面合作合同，与英国签署核能研究及创新中心建设的合作合同，与苏丹签署合作框架协议，并与沙特阿拉伯、保加利亚、约旦及阿尔及利亚等国家开展了核能领域的深度合作。

中核集团拥有中国最大的集研发、生产、销售、服务于一体的核技术企业，在放射性药物领域中核集团的国内市场占有率超过 70%，在放射源领域中核集团是国内唯一可生产供应医用放射源的机构。



3.3

STATE POWER INVESTMENT CORPORATION LIMITED

国家电力投资集团

State Power Investment Corporation Limited (SPIC) was established in June 2015 through the merger of China Power Investment Corporation and State Nuclear Power Technology Corporation. SPIC takes charge of two major national science & technology projects of large-scale advanced pressurized water reactor power plants and heavy-duty gas turbines. Its business covers electric power, heat, coal, aluminum, logistics, finance, environmental protection, photovoltaics, power station services and other fields.

SPIC is one of China's top five power generators and an integrated energy group with power as its core. It has a total installed capacity of 131 GW, including 75.05 GW of thermal power, 22.98GW of hydropower, 4.48 GW of nuclear power, 13.86 GW of PV power and 14.78 GW of wind power, with clean energy accounting for 47.57% of the total, demonstrating a distinctive clean development feature. It supplies 422.6 TWh of power and 155 million GJ of heat per annum. It also owns a coal production capacity of 80.40 million tons per year (t/y), aluminum smelting capacity of 2.5 million t/y and railway transportation line of 623 km.

Being one of China's three nuclear power developers and operators, SPIC owns a number of nuclear power plants (NPPs) under construction or in operation, such as Hongyanhe NPP in Liaoning Province, and Haiyang NPP in Shandong Province. It has also reserved several project sites in both inland and coastal areas of China. SPIC is the main entity, carrier and platform for the self-reliant innovation of the Gen III nuclear power technology, and the leading entity for the major national science & technology project of large-scale advanced pressurized water reactor (PWR). Enjoying full industry chain and strong technological capabilities in the R&D, design,

国家电力投资集团有限公司（简称“国家电投”）成立于 2015 年 6 月，由原中国电力投资集团公司与国家核电技术公司重组组建，担纲大型先进压水堆核电站和重型燃气轮机两项国家科技重大专项，业务涵盖电力、热力、煤炭、铝业、物流、金融、环保、光伏、电站服务业等领域。

国家电投是中国五大发电集团之一。是一家以电为核心、一体化发展的综合性能源集团公司。电力总装机容量 1.31 亿千瓦，其中：火电 7,505 万千瓦，水电 2,298 万千瓦，核电 448 万千瓦，光伏发电 1,386 万千瓦，风电 1,478 万千瓦，在全部电力装机容量中清洁能源比重占 47.57%，具有鲜明的清洁发展特色。年发电量 4,226 亿千瓦时，年供热量 1.55 亿吉焦。拥有煤炭产能 8,040 万吨，电解铝产能 253.5 万吨，铁路运营里程 623 公里。

国家电投是中国三大核电开发建设运营商之一。拥有辽宁红沿河、山东海阳等多座在运或在建核电站，以及一批沿海和内陆厂址资源，是实施三代核电自主化的主体、载体和平台，以及大型先进压水堆国家科技重大专项的牵头实施单位，肩负着国家三代核电自主化、产业化、国际化的

construction, operation and management of NPPs as well as manufacturing of nuclear power equipment and materials, it pursues the aim of self-reliant innovation, industrialization and internationalization of China's Gen III nuclear power.

SPIC has been a Fortune Global 500 company for ten consecutive years, ranking the 260th in 2022. it has a registered capital of RMB 35 billion, total assets of RMB 1,460.2 billion, and employees of around118,900. It holds nine listed and public quoted companies, two of which are red chip companies traded in Hong Kong while five offer A-shares in China's mainland. SPIC ranks forefront among China's top five power generators in terms of 2017 annual revenue and net profit.

SPIC is committed to global businesses. It has presence in 45 countries such as Japan, Australia, Malta, India, Turkey, South Africa, Pakistan, Brazil and Myanmar, with businesses covering power project investment, technical cooperation, EPC, etc. Its overseas assets amount to around RMB 77 billion, overseas ongoing installed capacity reaches 5.21 GW and planned overseas capacity reaching 45GW by 2030. In 2016, SPIC successfully obtained A2, A and A- international credit ratings from Moody's, Fitch Ratings and Standard & Poor's respectively and issued USD 1.2 billion overseas bonds for the first time.

In the new era, SPIC will comprehensively implement the philosophy of "innovative, coordinated, green, open and sharing" development initiated by the central government, and build a world-class clean energy enterprise based on the strategic positioning of an advanced energy technology developer, a clean low-carbon energy supplier, and an energy ecosystem integrator.

光荣使命，具备核电研发设计、工程建设、相关设备材料制造和运营管理的完整产业链和强大技术实力。

国家电投是世界五百强企业。国家电投是世界五百强企业。连续十年进入榜单，2022 年居第 260 位。公司注册资本金 350 亿元，资产总额 14,602 亿元，员工总数 118,900 人。拥有 9 家上市公司、公众挂牌公司，包括 2 家香港红筹股公司和 5 家国内 A 股公司。2017 年利润和净利润均位居五大发电集团前列。

国家电投是一家致力于全球业务的国际化公司。境外业务分布在日本、澳大利亚、马耳他、印度、土耳其、南非、巴基斯坦、巴西、缅甸等 45 个国家，涉及电力项目投资、技术合作、工程承包建设等。其海外资产总额约为 770 亿元人民币，境外在运装机容量达到 5.21 吉瓦（521 万千瓦），计划到 2030 年境外装机容量达到 45 吉瓦（4,500 万千瓦）。2016 年，国家电投成功获得穆迪 A2、惠誉 A、标普 A- 国际信用评级，并首次在境外发行 12 亿美元债券。

新时代，国家电投将全面贯彻落实中央提出的“创新、协调、绿色、开放、共享”发展理念，立足先进能源技术开发商、清洁低碳能源供应商、能源生态系统集成商战略定位，建设世界一流的清洁能源企业。

> *The site construction conditions of CAP1400 project which located in Rongcheng, Shandong province, are ready.*
>
> *在山东荣成石岛湾的先进压水堆核电站重大专项 CAP1400 示范工程，现场开工条件已经具备。*

http://eng.spic.com.cn/

3.4

CHINA GENERAL NUCLEAR POWER CORPORATION

中国广核集团简介

Established in September 1994, China General Nuclear Power Corporation (CGN, formerly known as China Guangdong Nuclear Power Group) is a state-owned large clean energy group with over 40 subsidiaries.

中国广核集团（简称中广核），原中国广东核电集团，成立于 1994 年 9 月，是伴随我国改革开放和核电事业发展逐步成长壮大起来的中央企业，由核心企业中国广核集团有限公司及 40 多家主要成员公司组成的国家特大型清洁能源企业集团。

Since its inception, CGN has been making unrelenting efforts to fulfill its mission of “developing clean energy to benefit mankind”, and to realize its vision of “building one of the world’s top clean energy enterprises”. By the end of October 2022, CGN has 26 nuclear power units in operation, with a total installed capacity of 29,380 MWe, 7 under onstruction, installed capacity of 838 MWe, with a total installed capacity of 31,740 MWe, which makes CGN the third largest nuclear power company of the world. In addition, CGN owns an installed capacity of 24,000 MWe for wind power and solar photovoltaic power generators in operation. Furthermore, CGN has made great strides in distributed energy, nuclear technology application and energy conservation technical services.

Moreover, CGN has set up 8 state-level nuclear power R&D centers and a national key laboratory to further add to its capabilities to simultaneously build, operate and manage multiple nuclear and other clean energy projects scattered across different regions.

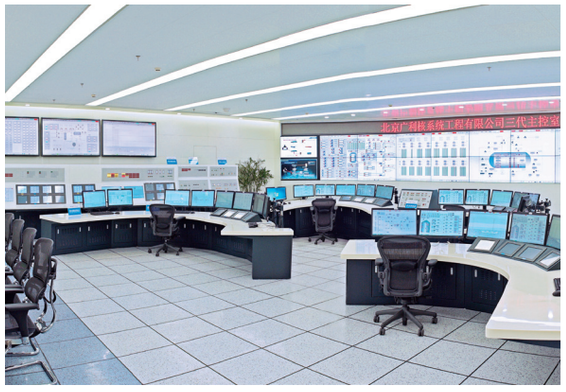
http://www.cgnpc.com.cn/

中国广核集团以“发展清洁能源，造福人类社会”为使命，以“成为国际一流的清洁能源企业”为愿景。截止 2022 年 10 月，中广核核电机组共 26 台在运，装机 2938 万千瓦；7 台在建，装机 838 万千瓦，是世界第三大核电企业；拥有风电、太阳能光伏发电等可再生能源在运装机容量超过 2,400 万千瓦。另外，在分布式能源、核技术应用、节能技术服务等领域也取得了良好发展。

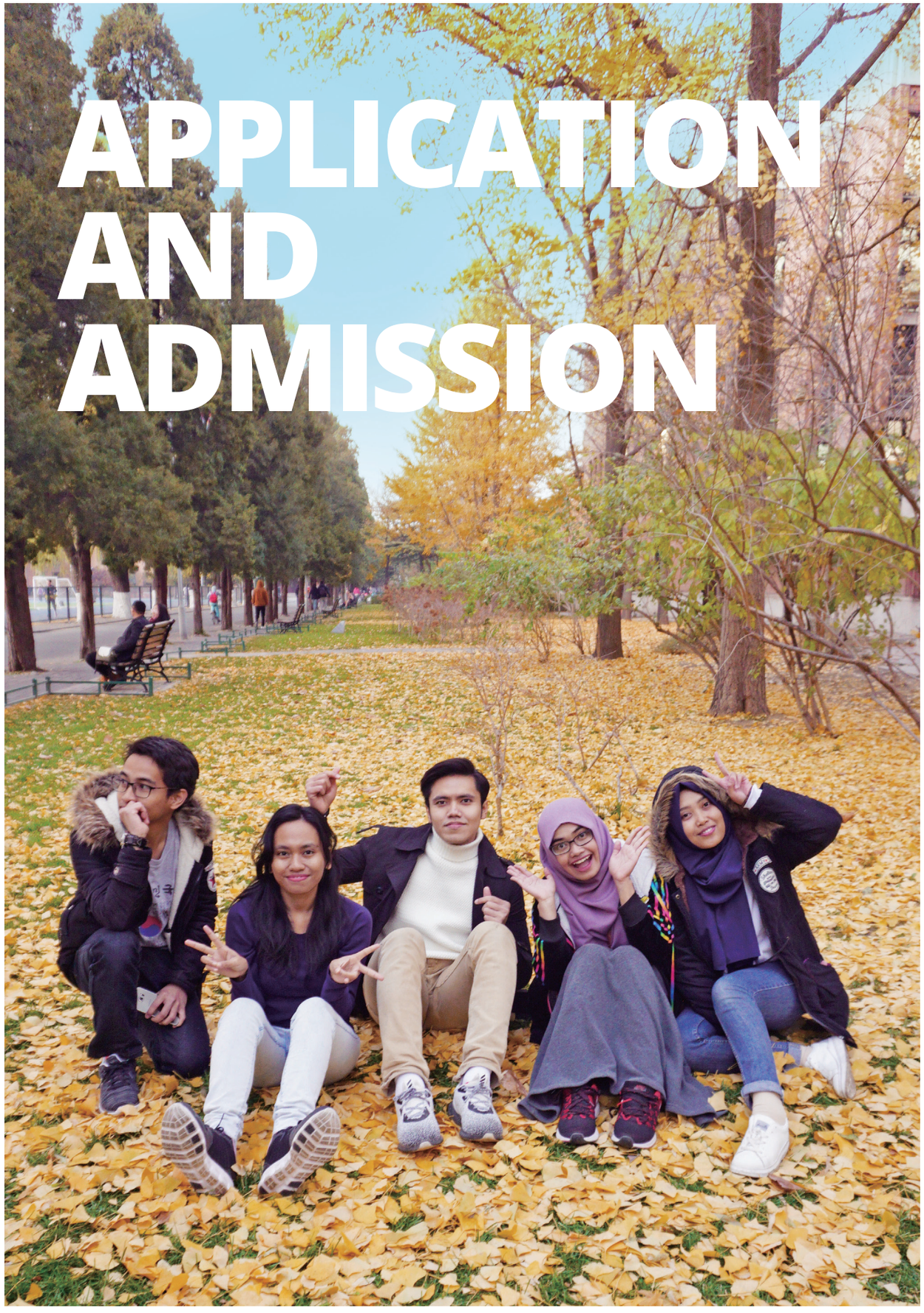
此外，中广核还拥有八个国家级研发中心和一个国家重点实验室，具备了在确保安全的基础上面向全国、跨地区、多基地同时建设和运营管理多个核电、风电、水电、太阳能及其他清洁能源项目的能力。

The mission of CGN is“developing clean energy to benefit mankind”, and the vision is“building one of the world’s top clean energy enterprises”.

中国广核集团的使命是“发展清洁能源，造福人类社会”为，愿景是“成为国际一流的清洁能源企业”。



APPLICATION AND ADMISSION



4.1

APPLICATION SCHEDULE

申请时间

Application	8:00 AM Oct. 15, 2022-17:00 Mar. 1, 2023 (Beijing Time)	申请	2022 年 10 月 15 日 8:00-2023 年 3 月 1 日 17:00 （北京时间）
Comprehensive Assessment	Before Mid-April	综合考核	4 月 15 日前
Pre-admission	May	预录取	5 月

*Please see Admission to TUNEM for the specific application schedule.
You are required to complete application for both TUNEM and CGS.
The final admission result can be found in the application system in early July.
The admission letter will be issued by THU Graduate Admissions Office after the final admission result is released.

* 具体申请时间请参考当年的招生简章
申请者必须同时完成 TUNEM 和中国政府奖学金的申请。
7 月初开始可在申请系统中查询最终录取结果。
被录取者，由清华大学研究生招生办公室发放录取通知书。

https://yz.tsinghua.edu.cn/en/

http://www.campuschina.org

4.2

ONLINE APPLICATION

在线申请

Step 1 Application online		**第一步 在线申请**	
Web.	https://yz.tsinghua.edu.cn/en/	网址	https://yz.tsinghua.edu.cn/en/
Steps	· Fill in the application information online · Upload the application documents · Pay the application fee online	步骤	· 在线填写申请信息 · 上传申请材料 · 完成申请费付款
Tips	Application fee is 800 RMB, for those who only apply TUNEM, the application fee will be waived.	备注	申请费用为 800 元人民币，仅申请核电项目的申请人可免交申请费。
Step 2 China Government Scholarship Application		**第二步 中国政府奖学金申请**	
Web.	http://www.campuschina.org	网址	http://www.campuschina.org

4.3

APPLICATION DOCUMENTS

申请材料

Please upload all the listed documents to the application system

请在申请系统中上传以下申请材料

1. Personal statement
2. Degree certificate and degree authentication
3. Academic transcript, for non-English native speaker, TOEFL or IELTS Certificate is advised to upload.
4. Two Recommendation letters
   a. One from scholars who have the title of associate professor or higher in related areas.
   b. Letter from CNNC/ SPIC/ CGN preferred.
5. Passport personal information page
6. Identification Photo
7. Other supporting documents required

*Please see the Admission to TUNEM for Specific Requirements of Application Documents.

1. 个人陈述
2. 学位证明和学位认证报告
3. 硕士及本科期间完整的成绩单，母语为非英语国家的申请者，建议提供托福或雅思成绩单
4. 两封推荐信
   推荐信之一来自中核集团、国电投集团、中广核集团者优先
5. 申请者个人普通护照（个人信息页）
6. 申请者个人近照
7. 其他申请材料

* 其他申请材料请参见 TUNEM 招生简章

4.4

EVALUATION AND ADMISSION

考查与录取

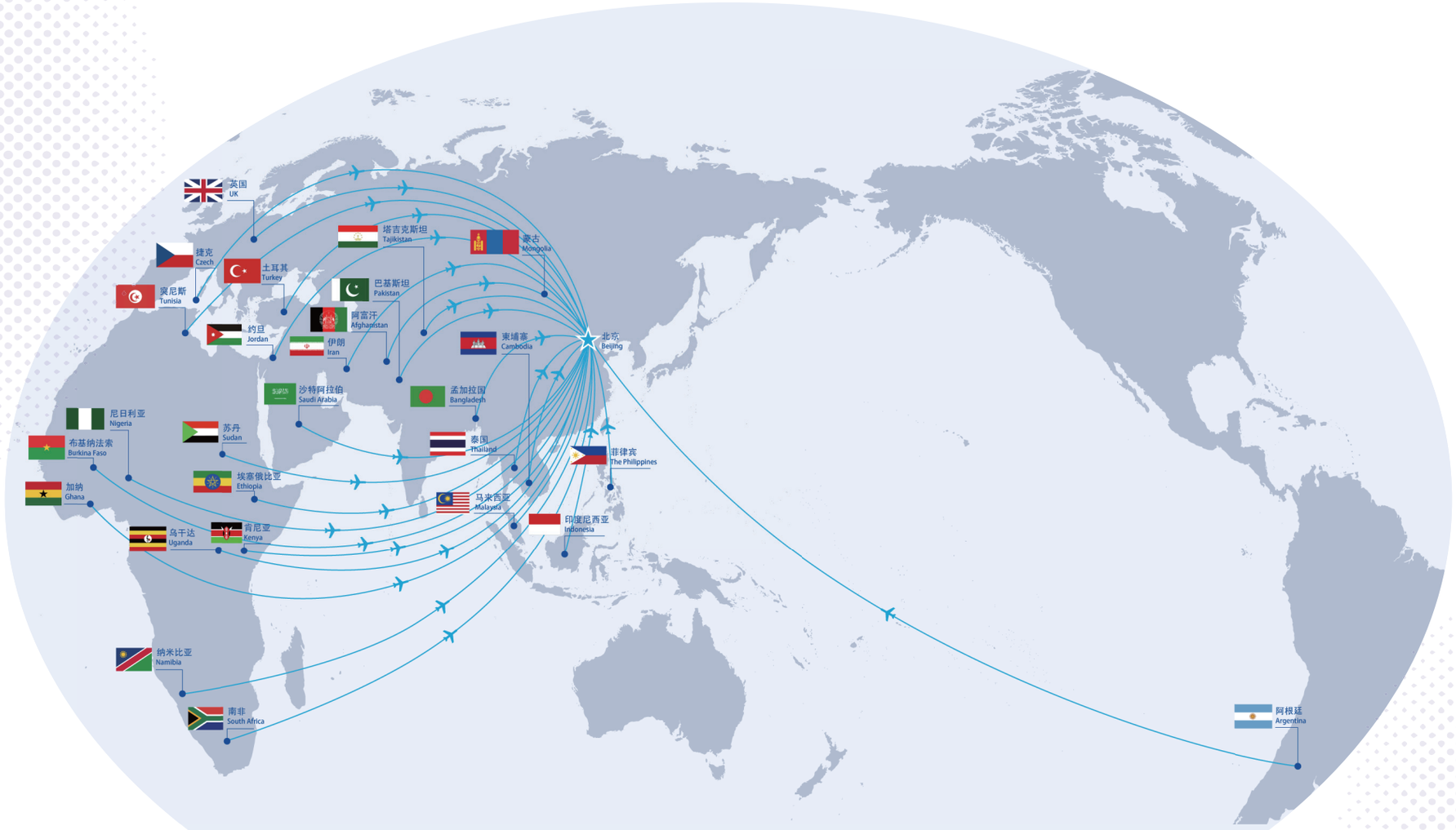
THU admits students based on evaluation of their application documents together with a comprehensive assessment. The admission committee of TUNEM will review the application documents and select candidates for the comprehensive assessment based on the review results. The comprehensive assessment is generally based on interviews. The specific content, format, requirements and time arrangements are determined by the admission committee of TUNEM and will be notified to applicants who enter the comprehensive assessment.

Tsinghua University comprehensively considers the results of material review, comprehensive assessment and other factors, selects the best candidates and determines the admission list. A Certificate of Admission will be issued by THU Graduate Admissions Office after the final admission result is released. Prior to this, applicants may check their admission status via this Application System.

清华大学采用“申请 - 审核”制，即申请材料审核加综合考核的方式选拔录取国际研究生。申请材料经核电项目专家组审查，根据综合审查结果择优确定参加综合考核人选。综合考核一般以面试为主，具体内容、形式、要求及时间安排等另行通知。

清华大学根据申请材料、综合考核等结果，择优选拔，确定录取名单。录取结果可通过清华大学研究生申请系统查询。被录取者，由清华大学研究生招生办公室发放录取通知书。

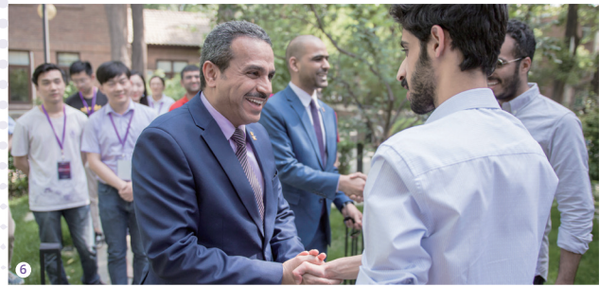
TUNEMers



5.1

CAMPUS LIFE

校园生活

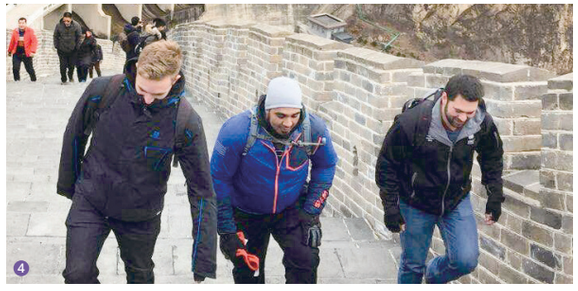


1. Color Run at Tsinghua University
2. Celebrate Christmas with Professor Liu
3. Dragon Boat Racing
4. Class
5. Welcome Ceremony for TUNEM 2017
6. Symposium of the 'Belt and Road' Nuclear Power Development–Saudi Arabia

5.2

CULTURE

文化浸润



1. Practice Kendo and Study East Asia Culture
2. Experience Chinese Painting
3. Experience Chinese Traditional Costume
4. On the Great Wall
5. Yunnan Social Practice Tour

5.3

INTERNSHIP AND ACTIVITIES

专业实践与企业活动

1. Attend International Conference on Nuclear Safety Nuclear Emergency and Nuclear Security
2. Visit 2020 China International Nuclear Power Industry and Equipment Exhibition
3. Visit Nuctech Company Limited
4. TUNEM 2017 Visited Nuclear Power Company and Communicated with Industry Supervisors
5. Visit Plant During the Internship
6. Visit State Nuclear Security Technology Center

5.4

ANNUAL NEW YEAR'S GALA

年终交流暨新年联欢

1

2

3

4

5

6

1. Group Photo
2. A General Report from TUNEM 2017 by Andi, Wahyuni, Syaheer Sabri from TUNEM 2017
3. Shosholoza
4. Martial Art Show Silat
5. Game
6. Gifts for TUNEMers

7

8

9

10

11

7. Crazy Indonesian
8. Pakistani Urdu songs
9. Chinese Martial Arts
10. A Report on Professional Internship from TUNEM 2017
11. Turkish Fireflies

5.5

GRADUATION CEREMONY

毕业典礼

1. Ceremony Venue
2. Remarks by YANG Bin, Vice President, Tsinghua University
3. Remarks by WANG Xuewu, Dean of Department of Engineering Physics
4. Presentation by Student representative
5. Ceremony Venue

6. Distinguished Guests
7. Embassy Officials
8. Gift Exchange
9. Gift Exchange
10. Gift Exchange
11. Buffet
12. Buffet

5.6

WORDS FROM TUNEMers

学生感言

Vincent Ben from TUNEM 2017

With the course being a joint venture between the top university in China and the three largest nuclear power companies, the opportunities which the course can offered are countless, I would thoroughly recommend this to anybody considering it. The choice to study in China, obtain a masters and gain industry experience in a two year course was a great decision and thanks to the generous scholarship, the course is available to all.

Sundstorm Nils Francis from TUNEM 2017

TUNEM is a fantastic opportunity to study abroad at one of the top universities in the world in a degree program that is both academic and applied. Nuclear engineering is a highly sought out profession in the UK and a degree with industrial experience highly enhances employability for graduates.

In my time here in China I have gained lots of cultural experience in a vibrant and exciting new city, Beijing has so much to offer and there is something for everyone. The TUNEM program offers the opportunity to travel around China and experience different aspects if the industry with trips to: Hong Kong, Shanghai, Shenzhen, Guangzhou and Hunan.

Nur Setyo Wahyuni from TUNEM 2017

Studying in the one of the best university in the world is not the only reason I feel so lucky and proud become a student in TUNEM program. The program itself is unique and beyond. It gives me not only experiences to learn in the class, but also makes me meet a lot of great people from various countries, visiting many Chinese cultural heritage and key companies in the nuclear industry, furthermore taking me to feel the real atmosphere of China Nuclear Research activities during the internship period. This program is a complete series to see a clear picture of China Nuclear Industry.

Jakoet Abu-bakr from TUNEM 2017

Being a TUNEMer of 2017 has provided me with rich life lessons and experiences, which I can definitely utilize in my professional and personal life and has given me great insight and respect for the Chinese Nuclear Industry. It has developed tremendously over the last 30 to 40 years. The Chinese nuclear industry is highly skilled and developed. The environment is conducive for learning and development and provides an excellent platform to broaden your understanding and knowledge of the nuclear power industry. It has given me the opportunity to establish valuable professional networks in this field that I could use in the near future to provide specialized nuclear engineering services to my country.

Syaheer Bin Sabri from TUNEM 2017

Being part of Tsinghua University Nuclear Engineering & Management (TUNEM) family is one of the precious gift I've ever experience in my life. For TUNEM 2017 intake, we came from various countries with our own beautiful and unique cultures. By mingling around and having fun together with our classmates during class and other activity to explore the beauty of China, we got to know more about each other and also about the country's background. The different in cultures and languages make each one of us learned something really new where we can't get it at somewhere else. That's make us more unite as a classmate and friend.

Ruaa Elbadry from TUNEM 2017

Before I applied to TUNEM program I was a little bit anxious since my undergraduate major was electrical engineering, but as I came through I found that doesn't really matter because the teaching strategy was to start with the basics to bring all of the students to the same level of understanding and knowledge. The teaching style was very much impressive in Nuclear energy engineering and nuclear science for sure. The professors have taken us through numerous research papers to give an insight of the nanotechnology.

Elyes Ghanouchi from TUNEM 2018

Everything here is so different for what we heard in media. People here are so nice, helpful and welcoming, the country is so developed. Also I'm in love with the Chinese food and you can eat every type of food that you want, you can find everything here.

The campus is huge and so beautiful, I understand why people said it's one of the most beautiful campus in the world.

TUNEM is like our family we study together, we travel together, play sport, we help each other, I'm the only Tunisian here and I never feel myself alone here.

Rosilatul Zailani from TUNEM 2018

I am the 2nd batch of TUNEM student. Our curriculum starts in early September 2018. Based on my experience, even approximately a week before the lecture, we have been given the honor of being a representative of Tsinghua University to attend the International Exhibition on China Nuclear Power Industry and Equipment. The program also facilitates students to directly see how nuclear technology happens in China by doing an internship program at the nuclear power company whose they are collaboration with.

Lee Jun Keat from TUNEM 2018

I would say that It is an honor being here, studying in Tsinghua University, one of the most popular university in the world. While having the prestige of being one of the top universities, Tsinghua University do not only focus on study. Contradictory aside from the normal classes, we, TUNEMers were given plenty of time to explore both the culture and beautiful places in China. We also wouldn't need to worry about these expenses be it. Hence, we would gain the chance to travel around China, knowing expects from different sectors and getting graduated from such renowned university all at the cost of literally nothing from us.

Selin Sultan Uckayabasi from TUNEM 2018

First I would like to point out that I am honored to be a TUNEM member and a Tsinghua University student. It has been a great adventure since I got here. Every single day I am learning and having fun at the same time. Best experience ever!

Tsinghua University is one of the best universities in the world and the campus is great! In our department, we have the best professors and the most concerned and helpful office staff. We are provided everything.

I love my life in China. I love Chinese people also that's why I am passionate about Chinese language and hopefully I will be able to learn it before I leave so I can work in a job where I can be connection between my country and China.

Ramadhan Valiant Gill S.B from TUNEM 2019

I am very grateful and honored to be part of the TUNEM family in Tsinghua University, one of the best University in the World. TUNEM is an excellent program that is formed by the best nuclear companies of China and Tsinghua University (THU). All the encouragement and the supports are so terrific even in a hard time of COVID-19, the professors and the staff are so amiable and kind. TUNEM program is a soaring opportunity for engineers to study the basics, design, management, construction and the development in terms of nuclear power technology.

Besides the academic part, DEP also encourages international students to get involved in the campus. I gained experience to study about the culture in China by participating in social research about the Yi minority in Yunan. I also joined both football and badminton team of the DEP. Those are very delightful. Thanks to all the professors, staff, colleagues and friends for all the memories and sharing.

Zahabi Mustafa from TUNEM 2019

TUNEM is an opportunity like no other. It is a nuclear engineering degree from the best university in China. This opportunity comes with a full scholarship and also backing from the 3 nuclear power companies which exist in China. In addition to this, they offer practical experience in the internships, which is real-life application of the skills developed which will further open career opportunities. The campus life, cultural exposure, and the ability to meet many people from around the world is truly remarkable. Unfortunately, COVID-19 has limited my personal experience in China, however I would still recommend the program to anyone looking into the nuclear industry and interested in world culture.

Muhammad Waqar Azam from TUNEM 2019

It is an honor for me to be a part of China's top university, in fact one of the best universities in the world. The moment I stepped into Tsinghua, it felt like a dream came true. To be a TsinghuaRen and a TUNEMer, it seems like I am very lucky where I got many chances to excel and gain knowledge in my field. TUNEM did not only provide me opportunity to gain technical knowledge but also to know more about China, its culture and history. One of the best things being part of the TUNEM program is that I got a lot of opportunities to interact with China's three main nuclear power companies i.e. CNNC, SPIC and CGN that helped me to know more about latest research and trends in nuclear field. In short, TUNEM program provided me opportunity to get better and better in every walk of life including education, sports, volunteer work, culture exchange etc. I must say that I am enjoying my life in big & beautiful campus of Tsinghua.

It is also pertinent to mention that all the teachers, staff and three companies are very supportive and always willing to help. I would also like to appreciate the Department of Engineering Physics and three companies for their untiring efforts during pandemic which will make sure to complete our degree in time. I would strongly recommend everybody who wants to pursue education in nuclear field to apply for TUNEM program.

Dzovor Yvonne Sefakor from TUNEM 2019

Being part of the TUNEM Program in Tsinghua University, the top university in China, is a wonderful opportunity that I would not take for granted. It is an honor to be part of the TUNEM family.

I belong to TUNEM 2019. My batch is unique because of the pandemic we all experienced. This changed the conventional way of learning. I personally had to study online all the way from Ghana and waking up at odd times to join classes. Despite this, I was able to enjoy the courses that were taught and understood the basics of nuclear engineering that the program offered. I also experienced the first online internship ever organized for TUNEMers. It taught me that we as humans are not limited and that I can achieve anything when I'm focused.

I am bold to say that the TUNEM program has opened China and its rich culture to me. The few months I've stayed allowed to to understand Chinese who are hardworking and lovely people.

Studying in the beautiful Tsinghua campus is a once in a lifetime experience. I will never forget the beautiful autumn season in Tsinghua and the delicious canteen food. China is the first country that I've experienced bicycle traffic. It's amazing!!

I want to thank everyone involved in the TUNEM program for giving their time and efforts in enriching our knowledge within the nuclear industry and offering us wonderful Chinese experience. I appreciate your efforts!

https://www.ep.tsinghua.edu.cn/en/index/Downloads.htm

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清華大學
Tsinghua University

CONTACTS

FOR ADMISSION

Graduate Admission Office, Department of Engineering Physics

86-10-6278 2677 gwyjs@tsinghua.edu.cn

Graduate Admission Office, Institute of Nuclear and New Energy Technology

86-10-6277 1089 hyyjyk@tsinghua.edu.cn

FOR VISA OR CAMPUS LIFE

International Students & Scholars Center, Tsinghua University

86-10-6278 4857 iso@tsinghua.edu.cn

FOR THE RECOMMENDATION LETTER FROM CNNC, SPIC OR CGN

CNNC

Mr. Zhang Lin, zhanglin@cnos.cn

Mr. Fu Qiang, fuqiang@cnos.cn

SPIC

lidan03@spic.com.cn | sixinlin@spic.com.cn

shiyubo@spic.com.cn

CGN

tangwz@aliyun.com

For more information about TUNEM, please visit:

https://www.ep.tsinghua.edu.cn/en/index/Downloads.htm