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# Fifth AC21 International Forum 2010, at Shanghai Jiao Tong University

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Shanghai Jiao Tong University is pleased to host the Fifth AC21 International Forum in Shanghai, Oct. 18–20, 2010. The theme of the 2010 Forum will be "Competition and Cooperation among Universities in the Age of Internationalization," addressing different problems facing universities in this era of ever-deepening contact among institutions of all nations and between universities and the global society.

The Forum will bring together AC21 members as well as other university leaders, scholars, and policymakers to discuss how universities would choose to act in the age of internationalization for their best interests and those of society. To illuminate how international competition and cooperation among universities impacts institutional quality, we have chosen three sub-themes for the Forum:

- University Ranking and the Evaluation of Higher Education
- Graduate Education in the Age of Internationalization
- Building World-class Universities in the Age of Internationalization

The AC21 Steering Committee Meeting will be held on Monday, Oct. 18 on Shanghai

#### Dr. Zhang Wenjun Vice-President Shanghai Jiao Tong University

Jiao Tong University Minhang Campus, where the AC21 Steering Committee will review past work and discuss the future of the global consortium. In the



morning of Tuesday, Oct. 19, at the Regal International East Asia Hotel, the Forum will open followed by keynote speeches and panel discussions addressing the Forum theme and overviews of the three sub-theme forums. In the afternoon of Tuesday, Oct. 19 and the morning of Wednesday, Oct. 20, three concurrent sub-theme forums will be held in the same hotel, and all participants are free to join any forum they are interested in to present their own views and discuss others' work. The Forum will close in the early afternoon of Wednesday, Oct. 20, after which the AC21 General Assembly Meeting will be held at the same place, where we hope our colleagues from AC21 member institutions from around the world will provide insightful suggestions on how AC21 could strengthen its world impact and help its members expand collaborations with one another.







Detailed information about the Fifth AC21 International Forum can be found on: <u>http://</u><u>gse.sjtu.edu.cn/ac21</u>, and we hope AC21 members will participate actively in the Forum.

When the Forum is held in October, the World Expo will also be nearing its conclusion by the river of Huangpu in Shanghai. Therefore, during this festive occasion, we are pleased to offer a one-day trip to the World Expo site on Thursday, Oct. 21, to all participants of the Forum. But if you prefer to visit the Expo site on another day, you can also choose to take the subway or a taxi yourself there, and information about the Expo can be found on the official Expo site: http://en.expo2010.cn/index.htm.

The Forum's main venue and accommodation will be in the Regal International East Asia

Hotel, which is located right in the center of the French Concession, with cafes, bars and beautiful gardens situated along the boulevard, and is within walking distance of Shanghai Jiao Tong University's old campus – Xuhui campus, and Shanghai's best dining, shopping, and entertainment center – Xujiahui. Participants may visit the old SJTU campus to enjoy the flavor of one of the oldest institutions of higher learning in China, or explore the history and culture of this energetic city themselves during their stay in Shanghai.

We look forward to hosting the Fifth AC21 International Forum in Shanghai this October, when we will share with all participants our experiences in university internationalization and university ranking, and learn from theirs. I believe the Forum will turn out to be an invigorating event and wish it a great success.

## The 7th AC21 Steering Committee Meeting Report





The annual AC21 Steering Committee Meeting was held for two days from Oct. 29 to 30, 2009, in the conference hall of Nagoya University's Integrated Research Building (Arts and Humanities). Participating universities included the Chemnitz University of Technology (Germany) (2 delegates including Chancellor Eberhard Alles); Chulalongkorn University (Thailand) (Vice-President Kua Wongboonsin); Nagoya University (Japan) (President Michinari Hamaguchi, Vice-President Yoshihito Watanabe, and members of the AC21 General Secretariat); North Carolina State University (USA) (Vice Provost Bailian Li); Shanghai Jiao Tong University (China) (two delegates including Prof. Shaoxue Liu); the University of Sydney (Australia) (Mr. Nicholas Haskins, Program Manager, International Networks); University of Warwick (UK) (Mr. James Kennedy, International Office Director).

#### Dr. Yoshihito Watanabe Vice-President Director, AC21 General Secretariat Nagoya University

Observers were also present at the meeting including Jilin University (China) (Executive Deputy President Yulin Li and two others) as well as the University of Adelaide (Australia) (Pro Vice-Chancellor John Taplin).

At the meeting the following five items were on the agenda:

1) Activity report for the past year; 2) increase in membership fees; 3) reviewing the conditions for membership and reviewing candidate universities; 4) sharing summer school information; and 5) deciding the host universities for the Student World Forum to be held in 2011 and the International Forum to be held in 2012.

1) North Carolina State University, the host university of the 4th AC21 International Forum held in June 2008, and Chemnitz University

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of Technology, the host university of the 3rd Student World Forum held in June 2009, each carried out a presentation on their respective events. As a part of the presentation by Chemnitz University of Technology, a DVD with video images of the forum was shown. In addition, it was reported that the activities of AC21 were actively presented at meetings of organizations such as AIEA (Association for International Educators and Administrators), APAIE (Asia Pacific Association for International Education) and NAFSA (Association of International Educators). Finally, a report was made on programs adopted to support joint research activities by multiple AC21 members (AC21 Special Project Fund, AC21SPF). Please refer to page 9 of this newsletter for details.

2) There are four categories of membership fees in AC21 determined based on the GDP of each country. To help ensure that international forums are held, Nagoya University has been providing \$50,000 in financial assistance every two years. The following motions relating to this financial support were carried by the participants: i) to expand the scope of AC21 activities and ii) to eliminate the financial support provided by Nagoya University to hold international forums. As a result, the conclusion was reached that the annual membership fees should be increased, and a doubling of the current membership fees was approved.

3) The conditions for accepting new members were discussed. As a result, the participants all agreed that new candidates should be: i) a university from a geographical area where there are no current members, ii) a university that is highly active in education and research and is highly regarded internationally, iii) a university that supports the objectives of AC21 and has clearly demonstrated its desire to actively participate in the activities of this organization. It was also agreed that the number of members should be restricted to a modest level so as not to hinder the activities of AC21, and that there should be no more than two member universities from the same country except in exceptional circumstances.

Based on the above discussion, the University of Strasbourg in France, which was recommended by Nagoya University, and Stellenbosch University in South Africa, which was recommended by the Chemnitz University of Technology, were approved.

4) Member universities agreed to share information on summer school programs and to provide support to students who wish to take part in these programs using the increase in membership fees. In addition, the status of preparations for the AC21 International Forum to be held in Shanghai this year was reported by Shanghai Jiao Tong University. The forum will be held for three days from Oct. 18 to 20 with the theme "Competition and Cooperation among Universities in the Age of Internationalization".





5) It was decided that the 4th Student World Forum in 2011 would be hosted by Chulalongkorn University and the 6th AC21 International Forum in 2012 by the University of Adelaide.



Lastly, there was a general discussion on the activities of AC21 going forward. Nagoya University proposed that a practical activity like "AC21 international schooling" should be planned for the future. A participant pointed out that students who are accepted to participate in the Student World Forum should be juniors who will continue studying at their current university so that they can share their experience at the forum and its significance with other students who wish to participate in the next forum, otherwise "the Student World Forum will merely be a transient event." This point may need further discussion at Nagoya University as well.

## AC21 International Symposium Ends Successfully "Double Degree Programs: Prospects and Strategic Perspectives"







Dr. Masahiro Chikada Associate Professor, Center for the Studies of Higher Education Nagoya University

AC21 held an international symposium entitled "Double Degree Programs: Prospects and Strategic Perspectives" on the afternoon of Friday, October 30th, 2009 at the lecture hall of Noyori Materials Science Laboratory. The objective of this symposium was to deepen AC21 member universities' understanding of the double degree and clarify issues for utilizing the double degree program as a means toward deepening international collaboration in higher education.

Keynote speaker Akira Ninomiya, Director of the Open University of Japan's Hiroshima Study Center, explained how intensifying international competition causes movements in capital tie-ups, consolidation, and alliance building to progress toward a global scale on all fronts and how higher education is no exception to this trend. In general, the double degree system signifies studying at multiple universities during a fixed period of time and then obtaining multiple degrees from these universities. This system is significant because it increases the added value of a university education, while also enhancing students' competencies to secure employment after graduation. When implementing a double degree system, among other issues, it is necessary to arrange a system for transferring credits, develop research supervising system, and also coordinate the formats of degree titles. The double degree system requires innovations in maintaining the quality of education while also shortening the terms of study.

At the roundtable discussion following the symposium, John Taplin, pro-vice chancellor of the University of Adelaide in Australia, first presented an introduction of the implementation status of double degree programs at AC21 member universities. Prof. Taplin indicated that the double degree program was launched at member universities from the 1990s, that it is more pronounced in professional fields than in academic fields, that the language of instruction is English in the vast majority of cases, and that there is a wide variety of issues faced when recruiting students for such a program. Next, James Kennedy, director of the international office at the University of Warwick in the UK, raised problems such as how the double degree program is to be positioned within the mutual strategies of the participating universities and how the double degree program should be used as part of mutual cooperation among AC21 member universities.

Finally, during the general debate, a number of lively opinions were exchanged on the floor. One person pointed out that limits placed in Japan by the Graduate Schools Establishment Standards upon credit transfer of graduate programs were constrictive from the standpoint of reducing the term of study when working toward a double degree. Another person wondered how information and promotions should be provided to students regarding the double degree program.



## New AC21 Members

It is our pleasure to introduce to you two new members of AC21. At the Steering Committee meeting held last October, it was decided unanimously to admit the University of Strasbourg and Stellenbosch University. First, the University of Strasbourg is located in Strasbourg, France, and is one of the largest universities in that country, with 43,000 students and over 4,000 researchers. It is a globally competitive research university consisting of 38 schools or faculties. Our other member, Stellenbosch University, is situated in Stellenbosch, South Africa, with a rich history dating back to 1918, and is one of the top research institutions in the country. It enrolls 24,000 students, and consists of 10 faculties. With the addition of these two institutions, AC21 has now expanded out to the African continent, and has also regained representation from France after a two year absence. These universities also bring the number of members up to 20, now spanning five continents and 11 countries. We look forward to engaging in activities with our new members. Let's extend to them our warmest welcome!

#### Dr. Anne Klebes-Pélissier Vice-President of International Relations The University of Strasbourg

The origins of the University of Strasbourg date back to the early 16th century when Jean Sturm created an institution where one could study theology, philosophy, medicine and law. A strong intellectual center in Europe during the 17th century, the University then experienced three centuries of bicultural development being moved back and forth between France and Germany. In the wake of several historic developments, three separate universities were established in 1968 focusing on sciences, humanities and legal, political, social and technological education.

Over nearly two decades the universities have laid the groundwork for inter-university cooperation, strengthened over time by jointly designed and managed projects. Backed by this experience, the three universities decided to take a further step by uniting their potential for instruction and research within a single university.

And thus, on 1 January 2009, the University of Strasbourg was born – a unique and pioneering example of merging universities in France.

European by nature and international by design, the University's strengths and



assets stem from its active involvement in virtually every discipline comprising the current body of knowledge. As a young university founded on an age-old tradition, it strives to attain cross-disciplinarity so that this mixing fosters new research opportunities and produces courses that meet society's needs. The international dimension is fundamental for the University of Strasbourg and thanks to the world wide reputation of its research teams, built on excellence and efficiency, it emerges among Europe's foremost research universities. Each of the University's main academic fields of instruction is based upon research sections that are the driving force of the institution, with over 2,600 professors and staff.





The Technology Transfer Office, one of the very first developed in a French university, strives to promote the work of the researchers and facilitate partnerships with economic and institutional stakeholders.

An essential player in the promotion of scientific and technical culture, the University interfaces with its host city, Strasbourg. A beating heart of the Alsatian metropolis, solidly anchored in the European Higher Education Area, the University of Strasbourg has the potential to face the challenging international competition and is particularly proud of being a new member of the AC21 Network.

Thank you. Danke. Xièxie. Terima kasih. Arigatô. Khob chai. Kop khun krap. Dankie. Merci.

#### Robert Kotzé Director, Postgraduate & International Office Stellenbosch University

Stellenbosch University's Rector and Vice-Chancellor, Professor Russel Botman, announced his "pedagogy of hope" for the institution in 2007 which is now taking shape through an Overarching Strategic Plan (OSP) to elevate the institution to an institution in Africa that does not only want to be significantly *different* (relevant), on the basis of the past, but also wishes to be significantly *better* (quality), as viewed against the University's commitment with regard to the future of the people of the country and the continent.

The transformation of the University has thus far been driven by its Vision 2012 that foresees that, by 2012, the University will be an institution of excellence; will make a scientific and technological contribution to Africa; will be a role player in the South African community; and will promote both diversity and Afrikaans in a multilingual context. The current vision has brought the institution to a point where it must now embark on the next phase.

This process of renewal of an African University, including Stellenbosch, requires a closer connection to the international development agenda. The United Nations' Millennium Development Goals (MDGs) embody an international consensus of hope for a future in which new generations will thrive. Stellenbosch University has aligned itself with these goals. It has chosen five themes emerging from the MDGs as a basis for its strategic positioning. In this regard the University wishes to use its expertise in research, teaching and community interaction to:



- eradicate pandemic poverty and related issues
- enhance the physical and psychological wellbeing of people
- promote peace and security
- nurture and promote democracy
- promote a sustainable physical environment

The response through the OSP is thus one which seeks to position the University at the leading edge of universities in South Africa, to respond to the critical challenges which face South Africa and the continent, and to secure the University's place amongst the significant universities of the world.

Within the context of South African universities, Stellenbosch University is a mediumsized, research-focused institution. The academic community (teaching and research) at the University comprises a body of 800 academics (including 180 professors). The re-







search community is further strengthened by 120 post-doctoral fellows. The non-academic staff corps is around 1600 (including technical staff).

Stellenbosch University was home to 245 National Research Foundation (NRF)-rated researchers in 2008, indicating the level, recognition and quality of the scholars in all fields. The formal academic output in the form of accredited publications for 2008 was 2.1 per staff member, the highest research output per capita in the country.

Stellenbosch University hosts nine South African Research Chairs Initiative (SARChI) Research Chairs. The Research Chairs are in the fields of: Functional Nanostructured Materials; Experimental Petrology; Advanced Macromolecular Architectures; Genetic Tailoring of Biopolymers; Post-Harvest Technology; Photonics, Ultrafast and Ultra-Intense Laser Science; Post-traumatic Stress Syndrome; Economics of Social Policy; and Property Law.

Through an SA National Energy Research Institute (SANERI) Research Chair, the University has been awarded the responsibility to act as the hub of a postgraduate programme in Renewable and Sustainable Energy Studies. The overall objective of this initiative is to develop and enhance national capacity in renewable and sustainable energy in support of accelerated and shared economic growth within the area of sustainable energy.

Stellenbosch houses three national Centres of Excellence sponsored by the Department of Science and Technology (DST) and the National Research Foundation (NRF):

- DST-NRF Centre for Invasion Biology;
- DST-NRF Centre of Excellence in Epidemiological Modelling; and
- DST-NRF Centre of Excellence for Biomedical Tuberculosis (TB) Research.

It also houses the National Institute for Theoretical Physics (NITheP).

Using this significant research profile as a point of departure, one of the internal strategies that stem from the University's OSP is an aim to expand the postgraduate student body. In 2008, a total of 24686 students enrolled at Stellenbosch University. Of this, more than 8400 were postgraduates (of which 4379 were Master's students and 828 were Doctoral students). Across its ten faculties a comprehensive range of postgraduate programmes (Diplomas, Honours, Masters and PhD) is offered. All postgraduate programmes are offered in English.





# A Further Important Step Taken toward Closer German-Thai Cooperation within AC21

#### Katrin Schulz Chemnitz University of Technology

It is a fact that the world is growing together. In consequence, a modern and future-oriented higher education policy has to consider broadly the need for internationalization. The amelioration of the global connectivity of European universities, for example, was at the base of the idea of creating a "European Higher Education Area" within the decade starting in 1999, which actually incorporates 46 member states.

Germany has participated in this project from the very beginning and is at the forefront in the implementation of the so-called "Bologna reforms" which include, for example, the introduction of modularized BA/MA study programs, the measuring of achieved workload by





credit points, the broadening of the access to universities, and the enhancement of continuing education.

But the universities themselves are also asked to contribute actively to this process by developing innovative ideas and by starting initiatives to ameliorate their attractiveness for international partners. Therefore Chemnitz University of Technology is very pleased to be a member of AC21 because this network functions successfully as a sort of "think tank" for future-oriented concepts and comprises not only universities from Europe but from all over the world that are working closely together.

A good example for a promising partnership within AC21 is the cooperation between Chemnitz University of Technology and Chulalongkorn University Bangkok. In November 2009 a delegation from Chemnitz traveled to Thailand. On 23 November, the Chancellor of Chemnitz University of Technology, Eberhard Alles, held a discussion with the Vice President of Chulalongkorn University, Assoc. Prof. Chesada Sangsubhan, and members of the faculty of Engineering, about conditions and procedures for the mutual exchange of students and the conclusion of a Memorandum of Understanding.

Furthermore, both universities participated at the academic exhibition of the Chulachomklao Royal Military Academy Nakhon Nayok. On this occasion the delegation of Chemnitz University of Technology had the extraordinary honor to present its "3D visualization" project to Her Highness Maha Chakri Sirindhorn, crown princess of Thailand.

The visit in Thailand was a great success and contributed in an important way to broaden and strengthen the contact between Chemnitz University of Technology and Chulalongkorn University. Chemnitz University of Technology is looking forward to gaining international flair and experience through an exchange of students that may serve as an example for further partnerships in this area.

## Meet with AC21 Colleague in APAIE

AC21 General Secretariat plans to participate in Asia-Pacific Association for International Education (APAIE) 2010 conference and exhibit joint booths with Nagoya University. The APAIE 2010 conference will be held in Gold Coast, Australia from 14 to 16 April, hosted by Griffith University. The theme is "Educating for Extremes: Educating for global challenges in a rapidly changing world." The General Secretariat aims to promote AC21 activities through the booths and also to make contact with AC21 members present. If you are scheduled to take part in the APAIE conference, please visit AC21 booths. You are also one of the exhibitors!



# 2009 AC21 Special Project Fund

### Sino-Australian Three University's Academic Seminar on Food Safety Affected by Global Warming

Prof. Jianlong Li Professor and Director, The Global Change Research Institute, College of Life Science, Nanjing University

With the development of society and improvement of technology, people's food consumption is turning to quality and safety with quantity improving. Meanwhile, food safety has already gone beyond the national boundaries and becomes a global problem with the acceleration of globalization. Recent trends in global food production, processing, distribution and preparation are creating an increasing demand for food safety research. Improving the food quality safety level is also one of the important things that our country is urged to resolve. Food safety is now a top concern of government at all levels and of society. Now, Australia, the U.S., Japan and other developed countries are representative of advanced food safety level. They have effective and harmonious supervision systems, as well as comprehensive and easily operational systems of laws, regulations and standards. They possess the most advanced and complete testing technical systems; implement processing and animal disease control, pesticide-residue and veterinary drugs control, circumstance and contamination control, pathogenic microbial control, and third country food market access management and control; emphasize the whole course supervision from the farm to the fork; and reinforce the food producers' and merchandisers' own responsibility of ensuring food safety. The enterprises implement HACCP certification, strengthen self-controls such as voluntary product recall; while their governments reduce the excessively detailed legal restrictions, and stress the

consistency and harmony of food policy. It is clear that China should enhance its own food safety level by using the references of foreign experience and advanced operations.

In order to reach these aims of the Sino-Australian Food Safety Academic Seminar, our team had made some works as below from April to December, 2009:

- collected and observed a series of scientific data and information in China and Australia;
- (2) built scientific capacity through setting up an international disciplinary team and a database, and educating scientists;
- (3) visited each other in China and Australia and gave academic seminars by two university teachers;
- (4) provided an integrated technical report of the different state of policy and education on food safety between China and Australia in the future.
- (5) written one paper and sent an international APN proposal book for future research;
- (6) set up a bridge for the two countries in food safety cooperation as well as the broader study of food safety systems.

Therefore, our team has mostly finished the work tasks for its AC21 project and reached the final goals of the project. Lastly, we would like to give special thanks to the AC21 Special Project Fund and Secretariat for their support.

#### Laser Coarse-Fine Coupling Tracking Measurement for Robot Errors



Fig. 1 Calibrated robot for laser tracking test

A novel measurement for robot errors is proposed through the cooperation of three universities with support from the AC21 special project fund. The laser coarse-fine coupling tracking measurement is carried out in the measurement for robot dynamic or static errors. The research objects include robot pose, motion trajectory and parameter relationships between dual robot base coordinates. A calibrated robot is shown in Fig. 1. The measurement can not only meet the requirements of the large range, rapid response and dynamic tracking, but also achieve the high accuracy of submicroradian magnitude due to the particular opto-mechanical design with low cost. The research contents can be summarized as follows.

The measurement theory of coarse-fine coupling tracking is studied to build a theoretical model of the beam through the coarse tracking mechanism and the fine tracking mechanism. As a result, the tracking range of coarse tracking mechanism is no less than  $\pm 15^{\circ}$  in pitch angle and ±180° in azimuth angle. The maximum beam scanning velocity of coarse tracking mechanism attains 0.5°/s and the maximum scanning acceleration is 0.05°/s2 with the tracking accuracy better than 50 µrad. The fine tracking range is no less than 1400 µrad both in level and vertical field angle with the tracking accuracy better than 0.5 µrad. The hundredfold decreasing relation from prism tilting angle to beam deviation angle is theoretically validated in the fine tracking mechanism.

The error model of coarse-fine tracking mechanism is deduced by the differential method. The errors of beam deflection induced by prism rotation angle and prism angle have been dis-

#### Dr. Anhu Li School of Mechanical Engineering Tongji University

cussed. The mating relations among the prism deviation angle, step motor stepping angle and encoder resolution are studied according to the above analysis. A rectilinear step motor is used and main parameters is 1.8°/ stepping angle, namely the step length 7.9375 µm. The inner diameter of encoder is 40 mm with grating 6000, and the recommended measurement step is 5.4". The PC numbered card is applied with a subdivided signal till 4096 frequency doubling (line period and measuring step).

The optimization algorithm to improve the calibrated condition of robot error is deduced and analyzed. According to the mission definition of double robots, the mathematic model of double-robot basis coordinates is studied by the method of coordinate conversion. Moreover, the error removing method is further proposed by the simulation analysis. After building a robot experiment platform together with the laser tracking measurement system, the optical alignment is performed to complete the robot test. Then the relations between the laser tracking measurement system and robot pose, especially the harmonious motion parameters, are studied. The robot calibration method is also given according to the test experiment, and some factors affecting the uncertainty of test accuracy are also analyzed.

The next study will focus on the dual-robot motion trajectory test, especially dynamical error research. The test method and experiment project will validate the theoretical analysis and simulation results. Some error evaluation methods will be further studied for the improvement of the whole experiment system, and valuable related conclusions can be drawn as references in applied robotics fields.



# 2010 AC21 Special Project Fund

The AC21 Special Project Fund aims to promote the development of research and educational exchanges between AC21 members. The fund should assist various kinds of activities and research projects between the members.

The AC21SPF will be run from the AC21 budget which consists of annual contributions of member institutions. AC21 expects the fund to continue producing valuable results. The first application closed on February 26, 2010. Representative institutions of collaborative research projects between AC21 members applied for 2010 AC21SPF. These are the projects which can develop as an ongoing AC21 project, or as projects that contribute to the progress of AC21 in the fields of research, education, management and international exchanges. After a detailed examination by STC members, two projects will be adopted.

# **Upcoming AC21 Events**

2010	October	Fifth AC21 International Forum, Shanghai Jiao Tong University
		Eighth Steering Committee, Shanghai Jiao Tong University
		Fourth General Assembly, Shanghai Jiao Tong University
2011	[TBA]	Fourth Student World Forum, Chulalongkorn University
2012	[TBA]	Sixth AC21 International Forum, The University of Adelaide
		Ninth Steering Committee, The University of Adelaide
		Fifth General Assembly, The University of Adelaide

## AC21 General Secretariat Activities (2009.10 - 2010.3)

2009	October 15	78th AC21 Office Meeting
	November 15–17	Attend IFPU General Assembly
	November 26	79th AC21 Office Meeting
	December 24	80th AC21 Office Meeting
2010	January 22	81st AC21 Office Meeting
	January 28	Visit University of Minnesota
	February 18	82nd AC21 Office Meeting
	March 16–18	Visit Nanjing University, Tongji University, Shanghai Jiao Tong University
	March 24	83rd AC21 Office Meeting



# AC21 Members

Chemnitz University of Technology (Germany) Chulalongkorn University (Thailand) Gadjah Mada University (Indonesia) Huazhong University of Science and Technology (China) Jilin University (China) Kasetsart University (Thailand) Nagoya University (Japan) Nanjing University (China) National University of Laos (Laos) North Carolina State University (U.S.A.) Northeastern University (China) Peking University (China) Shanghai Jiao Tong University (China) Stellenbosch University (Republic of South Africa) The University of Adelaide (Australia) The University of Freiburg (Germany) The University of Strarsbourg (France) The University of Sydney (Australia) The University of Warwick (U.K.) Tongji University (China)

## AC21 Partners

Advantage West Midlands Asia House CHUBU Electric Power Co., Inc. ITOCHU Corporation NGK Insulators, LTD Toyota Motor Corporation

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