俄羅斯國際工程院台灣分會 會刊

Taiwan Chapter of International Academy of Engineering

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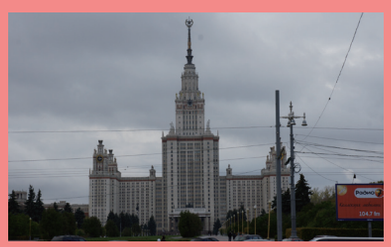

俄羅斯國際工程院台灣分會會刊

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資料來源：[唐獎教育基金會]
http://www.tang-prize.org/

【唐獎緣起】

從尹衍樑博士的祖父開始，教育就是尹家一脈相傳的家訓與信念。他們從不以企業或以金錢數字計算人生的價值。尹衍樑博士的父親尹書田先生，總是無時不刻地提醒他，教育才是傳世的大業：「如果你有能力幫助別人念書，是好事一樁。」尹博士秉持父親作育英才的理念，以興人興學為志業，一九八九年出資成立了光華教育基金會，捐贈獎助學金給多所學校，長期挹注的莘莘學子超過十四萬名。一九九四年，尹衍樑博士更在中國創辦北京大學光華管理學院，而且持續捐助各大學，設立基金以發展管理、醫學、工程、法律和人文等研究領域，不斷於世界各地作育英才。

尹衍樑博士以人生為課堂，以經驗為教材，期待以此和千萬學生共勉，分享生命的理念。尹博士希望有朝一日，他所幫助的青年學子也能承襲如此之生命態度，孜孜奮鬥，把成就回饋給更多的人。正因尹博士深知教育可以帶動社會的進步，所以他胸懷天下，成立唐獎，希望藉以獎助時代的先驅者，從而擴大、更新我們對人類社會與文明的視野與思考，使人世臻至美好的新境界。

FOUNDER's Philosophy

The Tang Prize is an extension of Dr. Samuel Yin's commitment to education. Investment in education is a cherished legacy passed down to Dr. Yin from the Yin family. Dr. Yin's father, Shu-Tien Yin, always reminded him that life should not be measured by one's wealth but by one's contributions to others by providing them with greater access to knowledge. With his father's ideal of nurturing and developing human potential in mind, Dr. Yin established the Guanghua Education Foundation in 1989, providing grants and scholarships to over 140,000 students. In 1994, he also founded the Guanghua School of Management at Peking University. In addition, he keeps supporting universities and cultivating talents in fields such as management, medicine, engineering, law, and the humanities.

Dr. Yin believes that education is life itself. He has shared his outlook and life experiences with millions of students in the hope that they, too, will give back to society by sharing what they know with others. In light of this, Dr. Yin established the Tang Prize with the realization that education is the key to driving social progress. The Tang Prize is committed to encouraging inquiring minds to explore new perspectives and insights to make the world a better place.

唐獎專欄

【唐獎精神】

唐獎的設立，是華人以中華文化數千年涵養，面對當前社會發展，以新視野與新思維，所注入的實際行動與思考。有感於全球化的進步與發展，當人類享受文明的豐厚果實與科技所帶來的便利同時，人類文明亦面臨氣候變遷、貧富差距、社會道德式微等考驗。為鼓勵世人重新省思永續發展的中庸之道，尹衍樑博士於 2012 年 12 月成立唐獎，設立永續發展、生技醫藥、漢學及法治四大領域研究，不分種族與國籍，遴選出對世界具實質貢獻與影響力的成就者。

唐獎所設之四大獎助領域，考究的是 21 世紀人類所需要的智慧，並勉勵時代的先驅者以其學易天下，以天下為己任，共同為世界文明而努力。「永續發展」表彰對人類在地球上永續生存與發展具開創性及卓越貢獻的研究成果；「生技醫藥」著重透過生物醫學或藥物研發，有效解決人類疾病，提升健康與生活品質；「漢學」指其廣義領域，重點在彰顯中華文化，促進人類內在的精神自覺；「法治」則基於人生而平等的信念，期待建立更為普及、完善的制度，以實踐人類及自然之共同福祉為目標。

唐獎發軔於東方思想沃土，擬以其文化價值與精神和世界相互調和，乃人類智慧與全球知識的淬聚，期待成為 21 世紀永續發展的重要推手，謙卑無私地推及每個角落，為世界之美好貢獻力量，展現新時代的價值與意義，創造源遠流長的未來。

The Tang Prize

In the advent of industrialization and globalization, humanity has greatly enjoyed the convenience brought about by science and technology, reaping unprecedented benefits made possible by progress and development. Yet, humanity also faces a multitude of critical environmental, socio-cultural, and ethical issues on an unparalleled scale, such as climate change, inequality, and moral degradation. Against this backdrop, Dr. Samuel Yin established the Tang Prize in December 2012 to encourage individuals across the globe to chart the middle path to achieving sustainable development by recognizing and supporting scholars for their revolutionary efforts in the four major fields of Sustainable Development, Biopharmaceutical Science, Sinology, and the Rule of Law. The Tang Prize is truly global in reach, with laureates selected on the basis of the originality of their work along with their contributions to society irrespective of their nationality or ethnicity.

Rooted in the long-standing cultural traditions of Chinese philosophical thinking and in an outlook of convergence and mutual enrichment with other traditions, the Tang Prize aims to provide fresh impetus to the promotion of first-class research and development in the 21st century. Implemented with self-effacement and selflessness, the Tang Prize seeks to bring about positive changes to the global community and to create a brighter future for all humanity.

唐獎專欄

【四大獎項】

永續發展獎

唐獎所獎助之「永續發展」獎項是表彰對於人類社會在地球上永續生存與發展具有開創性及卓越貢獻的科學與技術，包括工程與建設、能源、環境與生態等領域。

生技醫藥獎

唐獎所獎助之「生技醫藥」領域，表彰具原創性之生物醫學及藥物研發之科學研究，對於重要疾病之預防、診斷及治療有明確之影響，以生技醫藥解決人類疾病的問題，有助於人類健康之增進。

漢學獎

唐獎所獎助之「漢學」，意指廣義之漢學，包括研究中國及其相關之學術，如思想、歷史、文字、語言、考古、哲學、宗教、經學、文學、藝術（不包含文學及藝術創作）等等領域。本獎旨在表彰漢學領域之成就，並彰顯中華文化對人類文明發展之貢獻。

法治獎

基於人生而平等之信念，個人，包括國家和國際組織，皆受法律之規範。唐獎提倡法律應兼顧正當程序與實體正義，為和平、人權、永續發展而奮鬥，以追求人類及自然之共同福祉為最高目標。唐獎所設置之法治獎，係獎助對法治理念或實踐有創新，進而對法治之實現貢獻卓著之個人或機構。

Award Categories

The Prize in Sustainable Development

The Tang Prize in Sustainable Development recognizes those who have made extraordinary contributions to the sustainable development of human societies on earth through ground-breaking innovations in science and technology in fields such as engineering and construction, energy, and environment and ecology.

The Prize in Biopharmaceutical Science

The Tang Prize in Biopharmaceutical Science recognizes original biopharmaceutical or biomedical research that has led to significant advances towards preventing, diagnosing and/or treating major human diseases to improve human health.

The Prize in Sinology

The Tang Prize in Sinology recognizes the study of Sinology in its broadest sense, awarding research on China and its related fields, such as Chinese thought, history, philology, linguistics, archeology, philosophy, religion, traditional canons, literature, and art (excluding literary and art works). Honoring innovations in the field of Sinology, the Prize showcases Chinese culture and its contributions to the development of human civilization.

The Prize in Rule of Law

All individuals are born equal, and everyone, including states and international organizations, is accountable to the law. For the purpose of the Tang Prize, the Rule of Law encompasses due process and substantive justice, and champions peace, human rights, and sustainable development in order to serve the common good of humankind and nature. The Tang Prize in the Rule of Law recognizes individual(s) or institution(s) who have made significant contributions to the rule of law, reflected not only in the achievement of the candidate(s) in terms of the advancement of legal theory or practice, but also in the realization of the rule of law in contemporary societies through the influences or inspiration of the work of the candidate(s).

「唐獎光輝 世界共響」－唐獎週活動介紹

資料來源：[唐獎教育基金會]
http://www.tang-prize.org/

唐獎榮耀暨獎章證書展

日期：2014 年 9 月 1 日至 9 月 28 日

地點：中正紀念堂

為介紹唐獎及榮耀唐獎得獎人的成就，本次展覽將唐獎四大獎項領域的精神與意涵，及第一屆唐獎得獎人在獎項的奉獻與精神以展覽的形式一同呈現在世人眼前。

另，唐獎教育基金會與台灣創意設計中心自 2013 年底即合作舉辦「唐獎獎章國際設計邀請賽」與「唐獎證書設計競賽」。獎章設計 10 位國際頂尖設計師參賽，證書部分則針對台灣設計師徵稿。經過初決選，5 月 22 日宣佈唐獎獎章設計由日本設計大師 Fukasawa Naoto (深澤直人) 掄魁；證書則由台灣設計師黃維瀚以「開啟非凡」奪得青睞。

唐獎書畫選粹展

日期：2014 年 9 月 5 日至 9 月 28 日

地點：故宮博物院

為彰顯唐獎發軔於東方思想沃土，以其文化價值與精神和世界相互調和，故第一屆唐獎典禮系列活動的第一項活動 - 歡迎酒會的場所，選擇於故宮辦理，無論建物外觀或實質內涵，均能代表東方建物指標及東方思想精髓，且足能營造出讓貴賓倘佯在中華文化之氛圍及空間，讓貴賓能有別於其他場域的獨特感受，成為唐獎頒獎活動的特色。

另為充分表達唐朝融合各種宗教、文化、民族，多元而包容，開創中華歷史上最璀璨的盛世，故宮同時特別舉辦「唐獎選萃展」，特選足以表達唐朝璀璨盛世的唐 玄宗 鶺鴒頌、唐 李昭道 春山行旅圖、唐人 宮樂圖、五代南唐 周文矩 畫明皇會棋圖、宋 李公麟 免胄圖、宋 李公麟 畫麗人行等至高文化價值的書畫，以輝映唐獎得獎者的崇高成就。

唐獎歡迎酒會

時間：2014 年 9 月 15 日 (一) 18:30-20:30

地點：國立故宮博物院

歡迎酒會將為一系列的唐獎週活動拉開序幕。歡迎酒會的地點特別選在收藏中華文化瑰寶的國立故宮博物院，將邀請首都台北市長為唐獎祝福，及中研院院士、海內外貴賓、各界代表參加。酒會後安排故宮博物院為唐獎安排的書畫選粹特展，呈現中華文化豐厚的人文底蘊。

「唐獎光輝 世界共響」音樂會

時間：2014 年 9 月 16 日 (二) 19:30-21:00

地點：國家音樂廳

演出者：廖瓊枝、林惠珍、魏海敏、NSO 國家交響樂團

指揮：邱君強

唐獎音樂會在具有東方文化氣息之國家音樂廳舉行，以優美的樂聲彰顯每位獲獎者的研究成就外，期藉由音樂會活動表演，展現台灣表演藝術及豐厚文化創意。唐獎特別邀請國家交響樂團，以中西合流的形式，精心規劃將傳統戲曲與西方交響樂作跨界結合，表達如唐獎所希望的創新、整合性概念，將是一場世界上難得一見之音樂饗宴。唐獎音樂會邀請的表演者皆為台灣國寶級的藝術家：

廖瓊枝：高齡 80 歲，一生致力於台灣傳統戲曲的保存與傳承，曾獲民族藝師薪傳獎及國家文藝獎。

魏海敏：台灣京劇第一女伶，是國際知名的京劇旦角演員、梅派傳人，投入京劇表演近 30 年。曾獲得 1993 年紐約亞洲傑出藝人金獎，2007 年國家文藝獎。

林惠珍：是第一位以泰雅族身分踏入聲樂樂壇的原住民，以富涵技巧與力度的聲音，在每首曲子中的情感表達都遊刃有餘，充分表現出所有曲調之優美、高貴及戲劇性。

邱君強：自幼學習鋼琴，曾跟隨徐頌仁教授學習鋼琴與指揮，就讀於台灣大學化學工程學系期間，曾任台大合唱團指揮及鋼琴伴奏。大學畢業之後，赴德國柏林藝術大學就讀，主修指揮。2006-2008 年間曾任國家交響樂團指揮。

國家交響樂團：國家交響樂團成立於 1986 年，現有 96 名團員，每年樂季演出約 80 場次。20 多年來世界知名的音樂家合作逾 700 多位，是一個自信、精銳，有文化意識的台灣藝術代表團隊。

唐獎得獎人大師座談

時間：9 月 17 日、20 日 -21 日

地點：台北 (漢學獎)、台中 (法治獎)、台南 (生醫獎)、高雄 (永續獎)

希望年輕學子可以親炙大師風采，學習大師對此領域之看法、生涯、人生觀、期許與勉勵，在北中南校園舉辦大師座談，聽眾為社會大眾、教職員及學生。

唐獎頒獎典禮

時間：2014 年 9 月 18 日 (四) 14:30-16:00

地點：國父紀念館

唐獎是 21 世紀起永續發展、生技醫藥、漢學及法治的重要推手，透過唐獎得主的貢獻與遠見，引領未來研究及教育年輕人，如何透過東方圓融、整合、宏觀，加上西方分類專精，東西融合，為未來世界之永續發展找出解決方案，並藉由唐獎得主來台互動交流以及透過國際學者、專家及媒體來台宣導，提升台灣於國際社會的能見度，這將是華人世界最重要的活動亮點，對科技、教育、文化、觀光等有重要影響。

唐獎盛宴

時間：2014 年 9 月 18 日 (四) 18:30-20:30

地點：圓山大飯店

晚宴是各界貴賓得以親炙唐獎得獎人風采的正式宴會，邀請國內外貴賓及各界代表出席，選定代表東方建築特色及富麗堂皇古典氣派的圓山飯店作為晚宴場所。席間將安排原住民的古謠傳唱為貴賓獻唱，展現台灣在地多元文化，另外，也準備唐獎創意料理，讓貴賓度過一個難忘的夜晚。

唐獎得獎人演講 (永續發展、生技醫藥、漢學、法治)

時間：9 月 19 日 (五) 09:00-18:00

地點：台北國際會議中心

為了讓國內各界可以親聞得獎人成就專業內容、影響及展望，舉辦得獎人演講，聽眾為專業領域人士，包括大學教授、學術研究者及社會該領域專業從業者。每個獎項一場次，共 4 場次。

唐獎教育基金會成立

Award Ceremony and Introduction of Tang Prize Week

Glory of the Tang Prize: Laureate and Design Exhibition

Date: 9/1 – 9/28

Venue: Chiang Kai-shek Memorial Hall

To honor the accomplishments of the first Tang Prize Laureates and better acquaint the public with the values of the Prize, the Foundation will present the life and works of each of the distinguished laureates in the first-ever Laureate and Design Exhibition.

Set right alongside our laureate displays are the inspired efforts of the design candidates from the Tang Prize Medal and Diploma Design Competition, which was held at the end of 2013 in collaboration with the Taiwan Design Center. Medal designs from ten world-leading designers reached the final selection process, while the diploma design was limited to submissions from Taiwanese designers only. After the initial discussion and selection, the Tang Prize Foundation announced the winners of the medal and diploma designs on May 22: renowned Japanese designer Fukasawa Naoto was selected for his overlapping, dragon-inspired medal; Taiwanese designer Huang Wei-han was selected for his diploma “Door to Outstanding Achievements.” The Laureate and Design Exhibition will collect the achievements of these exceptional individuals—laureates and designers—in one grand, inspiring display.

Tang Prize Week: An Exhibit of Select Painting and Calligraphy

Date: 9/5 – 9/28

Venue: National Palace Museum

The Tang Prize brings Eastern thought, value, and spirit to the fore of the world stage. This can be seen in our reception locale— the National Palace Museum in Taipei, which was chosen for its architectural beauty and cultural value. Within this very characteristic building, full of the symbols and tones of Eastern culture, guests will feel the elegance of Chinese civilization and the depth of

its history, and feel as though they've been transformed into another time, another place.

In addition to the reception, we will also be holding at the National Palace Museum the "Tang Prize Week: An Exhibit of Select Painting and Calligraphy," which will present to our guests the religions, the cultures, the ethnic groups, and the varied elements of Chinese civilization that reached a peak during the Tang dynasty. Guests will be able to appreciate the painting and calligraphic skills of the Tang and Song dynasty, in works such as *Ode to Pied Wagtails* by Emperor Xuanzong, *Traveling Through Mountains in Spring* by Li Zhaodao, *A Palace Concert* by anonymous, *Emperor Minghuang Playing Go* by Zhou Wenju, *Leaving Behind the Helmet and Beauties on an Outing* by Li Gonglin. In each brush stroke, the glory of the laureates' achievements will shine through.

Tang Prize Reception

Date: 9/15 (Mon) 7:00 PM – 9:00 PM

Venue: National Palace Museum

The Tang Prize Reception on September 15 will lift the curtain on our first ever Tang Prize Week. We have especially chosen for this event the National Palace Museum, an important center for the collection of Chinese art and historical artifacts. Present at the event will be Taipei Mayor Hau Lung-pin, Academia Sinica scholars, foreign guests, and representatives from a number of fields. Afterwards, the National Palace Museum will be open to visitors, with a special exhibition featuring Tang and Song dynasty artworks in the "Tang Prize Week: An Exhibit of Select Painting and Calligraphy," showcasing the remarkable cultural wealth of Chinese civilization.

Tang Prize Concert

Date: 9/16 (Tues) 7:30 PM – 9:00 PM

Venue: National Concert Hall

Players: Liao Qiong-zhi, Mewas Lin, Zhu Lu-hao, Taiwan Philharmonic

Conductor: Qiu Jun-qiang

A superb representation of the musical spirit of Chinese culture and music, the Tang Prize Concert brings the majestic sounds and grand sights that symbolize the accomplishments of our prize laureates. We have especially invited the Taiwan Philharmonic to present to the audience a unique mix of traditional Chinese opera with Western symphony. Innovation and integration—qualities central to the Tang Prize—will reach the audience through the music, the words, and the feelings of the performers. As we have invited a number of accomplished performers to the event, the concert will be a night of rare talent and wonder. Performers include…

Liao Qiong-zhi: At 80 years of age, all dedicated to the preservation and transmission of this traditional Chinese art, Liao Qiong-zhi is a recipient of the Folk Art Heritage Award and National Cultural Award of Taiwan.

Wei Haimin: The leading lady of Taiwan's Peking Opera world best known for her portrayal of the "dan" role, Wei has over 30 years of experience on the stage. She won the 1993 Outstanding Asian Artist Award in New York as well as the 2007 National Cultural Award of Taiwan.

Mewas Lin: The first Atayal individual to step on the Taiwanese music stage, Mewas gives us deep cutting portrayals of deep emotion with her strong performance voice. Her unique qualities give each performance a rare beauty and majesty that are especially well-suited to the stage.

Qiu Jun-qiang: After an attentive study of piano in his early years, Qiu has since studied piano and conducting under the accomplished Xu Song-ren. Then, during his study at the National Taiwan University Department of Chemical engineering, he conducted and played piano accompaniment for the university's chamber singers. Qiu traveled to Berlin, Germany for post-grad study, where he majored in conducting. From 2006-08, Qiu acted as the conductor of the Taiwan Philharmonic.

Taiwan Philharmonic: Founded in 1986, the Taiwan Philharmonic currently seats 96 superb musicians, and gives around 80 performances each year. Over the past 20 years, 700 world-renown musicians have collaborated with the Philharmonic. With its confident poise, talented musicians, and rich cultural tones, the Taiwan Philharmonic is an essential figure in Taiwan's musical and art world.

Masters' Forum

Date: 9/17, 20-21 (Wed, Sat, Sun)

Venue: Taipei (Sinology), Taichung (Rule of Law), Tainan (Bio. Sci.), Kaohsiung (Sustainable Development)

We sincerely hope that the youth will appreciate and be inspired by the spirit of the laureates to achieve greater accomplishments themselves. In this series of lectures given in a number of Taiwan's major cities, the general public will be able to better understand the laureates and their contributions to humanity.

Tang Prize Award Ceremony

Date: 9/18 (Thurs) 2:30 PM – 4:00 PM

Venue: Sun Yat-sen Memorial Hall

The Tang Prize will be an influential guide to the fields important to the 21st Century—Sustainable Development, Biopharmaceutical Science, Sinology, and Rule of Law. Through the contributions and vision of our prize winners, we hope to support and guide research and the education of our youth. Qualities specific to Eastern culture—oneness, integration, and broad vision—and those cherished by the West—analysis and classification—will come together as a whole more perfect than its parts to contribute to the sustainable development of the human race. Our prize recipients will also contribute to bringing Taiwan into the international spotlight through media coverage

and academic exchange and discussion. With its huge influence in technology, education, culture, and tourism, the Tang Prize is set to become the most significant event in the Asian world.

Tang Prize Banquet

Date: 9/18 (Thurs) 6:30 PM - 8:30 PM

Venue: The Grand Hotel

The Tang Prize Banquet, a celebration of the accomplishments of the Prize Laureates, will certainly be a night to remember. We have invited many notable personages from Taiwan and representatives from a number of fields to attend. As for the venue for this special event, we have chosen the Grand Hotel, a hotel that is symbolic of both Asian architecture and the magnificence of classical Chinese style. Greeting the distinguished guests at the event will be a presentation of Taiwanese aboriginal folk songs—which presets yet another layer of Taiwanese culture. Guests will also be able to enjoy a course of creative dishes designed especially for the Tang Prize Banquet.

Laureate Lectures

Date: 9/19 (Fri) 9:00 AM – 6:00 PM

Venue: TICC

Bringing the accomplishments of the Tang Prize laureates to a larger audience, we have arranged a series of detailed lectures in which the laureates in each of the Tang Prize fields (one lecture per category) will speak to professionals, students, and researchers about their life's work.

2014 Tang Prize Week

Date / Time	9/1-9/28	Sep. 15	Sep. 16	Sep. 17	Sep. 18	Sep. 19	Sep. 20	Sep. 21
		Mon	Tue	Wed	Thu	Fri	Sat	Sun
09:00	Glory of the Tang Prize: Laureate and Design Exhibition 9/1-28 @CKS Memorial Hall 10/4-11/9 @National Science and Technology Museum The Great Tang Painters: Painting and Calligraphy Exhibition 9/1-28 @National Palace Museum Open to public					Laureate Lectures @Taipei International Convention Center 09:00-10:20 Sustainable Development 11:10-12:10 Sinology 13:30-15:20 Biopharmaceutical Science 16:00-17:20 Rule of Law		
10:00				Masters' Forum 10:00 in Sustainable Development @National Sun Yat-sen University, KaoHsiung			Masters' Forum 9/20 10:00 in Sinology @Taipei 9/20 15:00 in The Rule Of Law @National Chung Hsing University, TaiChung 9/21 10:00 in Biopharmaceutical Science @National ChengKung University, Tainan	
11:00								
12:00								
13:00								
14:00					Tang Prize Award Ceremony @National Dr. Sun Yet-sen Memorial Hall			
15:00								
16:00								
17:00								
18:00					Tang Prize Banquet @The Grand Hotel			
19:00		Tang Prize Reception @National Palace Museum	Tang Prize Concert @National Concert Hall					
20:00								
21:00								

唐獎得獎人 全世界關注

資料來源：[唐獎教育基金會]
http://www.tang-prize.org/


Gro Harlem Brundtland

一、永續發展獎

格羅・哈萊姆・布倫特蘭夫人 (Gro Harlem Brundtland)

唐獎「永續發展獎」得獎人布倫特蘭夫人 1939 年出生於挪威貝魯姆政治世家。從小受父親的影響，研習醫學，1963 年畢業于奧斯陸大學醫學系，爾後于 1965 年取得美國哈佛大學公共衛生學院碩士學位。在哈佛大學研習期間，她受到啓蒙，了解「生態發展」的重要性，在那環境議題仍未是政治主流議題的時代裡，她已經深深體認到人類的健康與環境有極大的關係。1975 年她就任挪威環境部長，任內因她明快解決數個棘手的環境議題，聲名大噪，1981 年成為挪威第一位女性總理，也是挪威有史以來最年輕的一位。

有鑒於當時全球過度開發與環境資源過度消耗，人類必將面對這些重要的挑戰，而當時全世界唯有她曾經同時出任過環境部長和總理，聯合國秘書長任命布倫特蘭夫人領導「聯合國世界環境與發展委員會」(通稱為布倫特蘭委員會)，對當時議題提出建言。1987 年，她在聯合國大會上發表了《我們共同的未來》(Our Common Future) 的報告。此一文獻又稱為《布倫特蘭報告》，正式將「永續發展」定義如下：「永續發展是一發展模式，既能滿足我們現今的需求，同時又不損及後代子孫滿足他們的需求。」接著，她又催生了 1992 年的首屆「地球高峰會」，更讓各國簽下減少溫室氣體而訂定的《京都議定書》。

二、生技醫藥獎

詹姆斯・艾利森
(James P. Allison)
本庶 佑
(Tasuku Honjo)


James P. Allison


Tasuku Honjo

來自美國德州大學安德森癌症中心的免疫系主任詹姆斯艾利森，與來自日本京都大學免疫基因學的講座客座教授本庶 佑，共同獲得唐獎「生技醫藥獎」，艾利森博士和本庶博士的發現，促使大家在免疫治療法上尋求新的契機，同時也讓許多難以治療的癌症曙光乍現，他們發現了 CTLA-4 與 PD-1 微控制免疫系統的重要關鍵，這個發現提供抗癌藥物新的發展契機，可依此發展單株抗體，拿掉這兩個免疫煞車的作用，來活化免疫系統，為癌症免疫治療帶來革命性的重大突破，帶領人類進入醫藥新紀元。

早在 1987 年，艾利森就發現，人體的免疫系統有個平衡機制，分別有負責踩油門與踩煞車的功能，一個是能夠大量地增生免疫細胞，一個則是抑制免疫細胞的增生。艾利森發現兩個煞車因子的其中之一「CTLA-4」，他認為只要把「煞車」拿掉，在免疫細胞被活化下，殺死癌細胞的效力就更大。之後在 1996 年，艾利森更在《科學》期刊上發表論文，用實驗數據證明，老鼠身上的腫瘤可以被消除掉。1998 年，本庶佑的研究團隊也發現了另一個煞車因子，「那時，我們發現細胞會進行自殺，可是到了某一個階段，又有一些東西阻止了它們的自殺行為，我們剛找到它時，就稱它為『程式性死亡因子』，變成了今日的 PD-1。」，在標靶治療成為癌症治療主流的十多年後，唐獎兩大得獎人美、日學者艾利森（James P. Allison）與本庶佑（Tasuku Honjo）的「癌症免疫療法」，被喻為是癌症研究上的重大突破。

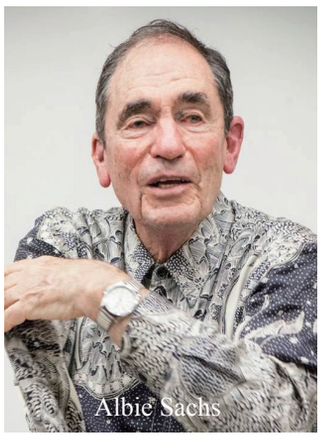

余英時

三、漢學獎

余英時
(Yu Ying-shih)

國際知名史學泰斗、美國普林斯頓大學榮譽教授余英時榮獲首屆唐獎漢學獎。僅管他在第一時間接受訪問時謙虛地表示，他覺得他自己「受之有愧」，「很意外，也不敢當」，但余英時教授深入探究中國歷史、思想、政治與文化，以現代知識人的身份從事中國思想傳統的詮釋工作，闡發中國文化的現代意義，論述宏闊、見解深刻，學界久尊為海內外治中國思想、文化史之泰斗。「究天人之際，通古今之變」為傳統學者治史之宗旨，余先生以其研究撰述與人生實踐，對此語做了最佳的現代詮釋。

余英時出生在中國天津，師承國學大師錢穆，之後遠赴美國哈佛大學，以現代學術方法詮釋中國傳統思想。中研院副院長王汎森說，「他的成就至今無人能超越，現在很難看到有學者如此堅持在歷史研究上，甚至退休後，研究仍持續不懈。」，中研院院士丁邦新表示，余英時的研究貫通古今，上起三代、下至明清，甚至是當代的各時段，在當今學界相當地罕見。



四、法治獎

奧比・薩克思

(Albie Sachs)

唐獎法治獎得獎人奧比·薩克思 (Albie Sachs)，畢生致力於打破種族隔離制度，一手草擬南非人權憲章，並在大法官任內，完成包括同性婚姻合法化等數項判決，讓南非憲法法院成為當代轉型正義的典範。

現年 79 歲的薩克思是猶太白人，出身在充滿種族歧視的南非，但心中保有對所有人的基本尊嚴，肯定不同社群的能力價值，年輕就讀法律，17 歲就參加「抵抗惡法」運動，1966 年被迫離開南非流亡，1988 年 4 月，南非政府特務在他的車底放置炸彈，意圖奪取他的性命，薩克思雖然幸運存活，但還是失去一條手臂和一隻眼睛的視力，他未採取以牙還牙的報復，反而以德報怨寫成《溫柔的復仇》一書，薩克思說：「成功得到自由，比向加害人施以同樣的傷害，更有力量。」；1990 年他回到南非，1994 年起擔任首任憲法法庭法官，也是已故南非總理曼德拉的好友，在人權奮鬥史上，和曼德拉齊名。

The Laureates and Their Accomplishments

I. Sustainable Development

Gro Harlem Brundtland

Dr. Gro Harlem Brundtland was born in Bærum, Norway in April 1939. Influenced by her father, Dr. Brundtland graduated with a medical degree from the University of Oslo in 1963 and earned her Master's degree in Public Health from Harvard University in 1965. During her studies at Harvard, she was inspired by the importance of ecology and came to an understanding of the close relationship between human health and the environment, even though environmental issues were not widely included in the political agenda of that time. In 1975, she was offered the position of Minister of Environment and became widely recognized for seeking to resolve various environmental issues. In 1981, Dr. Brundtland became not only the first female but also the youngest Prime Minister of Norway.

Under her leadership, the UN World Commission on Environment and Development (WCED), better known as the "Brundtland Commission," published its landmark report entitled "Our Common Future" in 1987 as a culmination of an international effort involving hundreds of experts and stakeholders. The term Sustainable Development was coined and defined in the report…

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The summit also initiated the most important international agreement for climate change, the United Nations Framework Convention on Climate Change (UNFCCC), which eventually led to the Kyoto Protocol.

II. Biopharmaceutical Science

James P. Allison

Tasuku Honjo

Dr. James Allison, Chairman of the Department of Immunology and Executive Director of the Immunotherapy Platform at the University of Texas, MD Anderson Cancer Center; and Dr. Tasuku Honjo, Professor at the Department of Immunology and Genomic Medicine, Kyoto University have been jointly awarded the first Tang Prize in Biopharmaceutical Science for their discoveries, which have given humanity a new strategy in the fight against many intractable illnesses, foremost among them—cancer. Doctors Allison and Honjo discovered, respectively, the key roles that CTLA-4 and PD-1 play in the immune function of human beings. New drugs have been developed using these new pathways for treatment that block the inhibitory function of these receptors, and thereby bringing functionality back to the immune system. Their work has brought a shift in the treatment paradigm, and has given humanity new hope in the battle against illness.

For the past 32 years, cancer has been at the top of the list of causes of death for many countries; consequently it has also been at the top of the list for research. Dr. Allison discovered that the human immune system uses a balance mechanism that is like the acceleration and braking systems on a car. When the accelerator is pushed, the immune system reacts positively by creating more immunocytes; when the brake is pushed, immunocyte creation is stifled. Dr. Allison discovered one of those "braking" mechanisms—CTLA-4—and hypothesized that if this brake were taken away, there would be nothing to stop the creation of more immunocytes that would then kill more cancer cells. In August of 1996, Dr. Allison and his team published their findings, including data on successful tumor removal from a mouse, in Science. Just two years later, in Japan, the independent research team led by Dr. Honjo found another brake. "We knew that cells self-destruct at a certain point. But, somewhere along the line, that self-destruct process was being stopped. When we found the brake, we called it 'programmed death ligand 1,' or simply PD-1." Doctors Allison and Honjo have broken a new path in cancer treatment, and treatments derived from their research have since become mainstream and effective.

III. Sinology

Yu Ying-shih

Yu Ying-shih, a well-known historical scholar and Professor Emeritus of Chinese Studies at Princeton University, was announced as the first recipient of the Tang Prize in Sinology, a field focusing on the contributions of Chinese culture in a wide variety of fields, such as thought, history, philosophy, and religion. When the prize announcement came to Professor Yu's attention, he expressed his feelings in one humble phrase, "I am not worthy of such a prize," a line in perfect harmony with his reputation as an intellectual in the classic Chinese sense of the term. Throughout his career, Professor Yu has reinterpreted the tradition of thought in China and revived the importance of intellectual history by shedding new light on the value, richness, and current significance of Chinese culture. Even within that vast field of culture and history, Professor Yu has a sound understanding of where modern China is as well as where it is heading. Through his vast oeuvre, Yu has interpreted historical change through a comprehensive, philosophical approach.

The now 84-year old scholar was born in Tianjin, China. During the early period of his studies, Yu was a student of Qian Mu, one of the great historians and philosophers of modern China; he later took up studies and was extensively influenced by western academia at Harvard University. "He remains to this day unsurpassed in his field. Even today it is rare to see someone so dedicated to historical research; even after retiring, he continues to do research," said Academia Sinica Vice President Fan-sen Wang. Dr. Pang-Hsin Ting, an Academician from the Academia Sinica, summarized Professor Yu's scholarly range as reaching as far back as the early classical period of China to the more recent Ming and Qing dynasties, and even extending to our modern period. "Such a broad mind is a rare thing, indeed," Dr. Ting said.

IV. Rule of Law

Albie Sachs

Albie Sachs has, through his life and work, contributed to the realization of the rule of law in a free and democratic South Africa. As activist, lawyer, scholar, and framer of a new Constitution, he helped to heal the divisions of repression, discrimination and hatred of the past; as a judge on the Constitutional Court of South Africa, he also helped to bring equal marriage rights to same-sex couples, which has become a model case of Transitional Justice in South Africa.

Albie Sachs was born in Johannesburg, South Africa, in 1935, into a Jewish family of Lithuanian background. After matriculating at the South African College Schools at the age of fifteen, he enrolled at the University of Cape Town for a five-year law degree in 1951. The next year, at age 17, he joined the Defiance of Unjust Laws Campaign and was arrested for sitting on a bench in the General Post Office reserved for non-whites. In 1966, he was again arrested and this time subjected to torture by sleep deprivation and intensive interrogation, which led to his exile to England in 1966. In April 1988, Sachs survived a bomb placed in his car by South African security services, losing an arm and sight in one eye. He told the story of his recovery in his book Soft Vengeance of a Freedom Fighter, the core idea being that "to get freedom was a much more powerful vengeance than to subject the people who had done these things to us to the same harm." After returning to South Africa, Sachs was appointed to the new Constitutional Court in 1994 by Nelson Mandela, his friend and fellow fighter for human rights.

古塞夫院長肯定唐獎為人類開創新局

資料來源：[唐獎教育基金會]
http://www.tang-prize.org/

國際工程院暨俄羅斯工程院為俄羅斯應用科學之最高研發機構，於國際間亦享有盛名，2014 年 3 月 25 日古塞夫院長 (Boris V. Gusev) 拜訪唐獎教育基金會，暢談其對唐獎的看法與期許。

古塞夫院長與唐獎基金會董事長尹衍樑博士相識七年多，是多年好友，尹博士是俄羅斯國際工程院副院長及院士，因此對於尹博士善心捐贈成立唐獎教育基金會的精神具有一定程度的瞭解。他了解尹博士在包含工程界、服務業界等各領域都有許多創舉，他認為其中最好的莫過於成立唐獎。

古塞夫院長認為，雖然唐獎是個新機構，今年才要舉辦首屆頒獎典禮，他表示「這只是一小步，一個小開端，在未來唐獎一定會吸引、收納更多人才，並對世界產生重大的貢獻。」古塞夫院長同時盛讚尹博士「是個非常有遠見、智慧的人，他等於是給當代的人類一支開啟新世界的鑰匙，讓未來百年間的學者去思考永續發展和形成的方向。」

陳振川執行長表示，目前世界面臨氣候變遷、災害頻繁、人口壓力、糧食飲水不足等情況，因此唐獎設立永續發展獎，就是希望全人類能夠關注人類對大自然環境的破壞及與之和宜共存的議題。

古塞夫院長指出，與人類生活最有切身關係的其實是農業、水利、工程等領域，他指出「永續發展獎會讓研究者開始朝不同領域去思考，例如

農業上為了除去病蟲害而用有毒藥劑，但最終的受害者仍是大自然和人類，所以永續發展獎給農業界、化學界一個跨領域結合的機會，是給大家一個新信號，除研究自己的領域外，也不會忘記其他領域的發展。」

古塞夫院長同時提到太空垃圾的問題，過去人類不以為意，認為太空無邊無際，將眾多的廢棄物丟棄在太空中，但現在卻發現會影響飛行安全，所以從一開始就應該朝不該丟太空垃圾的方向思考。十年前的隨手一丟、無心之舉，對現在的太空環境影響就非常大，更何況人類已經存在於地球上數千年，可見對地球所造成的影響有多巨大。他同時提出，「唐獎中永續發展獎的任務並非僅挑選現存於世的產品或研究，而是要從永續發展的定義來思考如何在未來減輕對日常生活環境的影響；對永續發展獎項來說，最大的困難和挑戰，在於研究成果能讓人類信服、要能讓人產生對永續發展的信念。」他解釋說，許多人造物質對於人類是有使用上的好處，例如為了禦寒和保溫而發明保麗龍、聚合物等材質，也許可以節省冷暖氣的耗費，但對人類、自然環境實為有害，而且這些失敗案例的影響力會一直存在於地球上，因此必須對每一個案預見其未來並找出有智慧的應用方法。

古塞夫院長肯定唐獎設置永續發展獎，他表示「這是一種哲學性的思考方向，表達人類應與自然和平共存，不應只思考自己能吃得飽、穿得暖、維持自己身體的健康，而是要思考地球上萬物的發展。」他接著說，「人類使用核能，開採各種能源，以為天然資源取之不盡、用之不竭，但事實並非如此。」所以設立永續發展獎，表示考慮到了人和自然之間的關係，是非常有遠見的創舉。

談及唐獎與諾貝爾獎之的不同時，古塞夫院長指出，一般人認為基礎科學對人類的生活產生

很大的影響，例如物理、化學等，但是他認為最直接影響人類生活的是工程等領域，而永續發展對人類未來的影響更深遠。唐獎的四個領域與諾貝爾獎的獎項沒有重疊的領域，而與其說唐獎與諾貝爾獎互補，不如說唐獎已經開創了一個新的格局，不能用相同角度比較。

除了表達對唐獎與諾貝爾獎的看法之外，古塞夫院長同時補充對工程界獎項的看法，他指出在工程界中也設有許多獎項，例如太空獎、能源獎、數學獎等，但相對侷限於特定領域，但永續發展獎是跨領域的，開啟人類發展的新世界，所以古塞夫院長同時也期勉工程界應該開發新工具或新工法，以降低對大自然的衝擊。

古塞夫院長說，他很高興能在永續領域貢獻一些心力，也在各種場合盡量宣揚唐獎和唐獎精神至歐洲、獨立國協等地。他期待唐獎一年辦的比一年好，若今年沒有十分周延，期望明年可以改善，至於是否得獎是其次，重要的是，唐獎是給全人類的一個信念，所以更要肯定唐獎有永續發展獎。

陳振川執行長表示，從古塞夫院長的分享中能感受到他宏觀的格局和大智慧，對唐獎的未來是鼓勵也提供努力的方向。陳執行長同時感謝古塞夫院長對國際間宣揚唐獎，「像古塞夫院長這樣的專業人才和社會菁英是全人類的重要資產，且如有更多人能像院長一般認同唐獎的精神，相信對世界會產生重大的影響。」

古塞夫院長訪問唐獎基金會　　攝於 2014/03/25

Prominent Russian engineer praises Tang Prize for contributions to sustainability, research

The Tang Prize Foundation received a special visit March 25 from Dr. Boris Vladomirovich Gusev, a renowned Russian engineer who heads both the Moscow-based International Academy of Engineering and the Russian Academy of Engineering.

Given his more than seven years of friendship with Tang Prize Foundation chairman Dr. Samuel Yin – vice president of the Russian Academy and academician there – Dr. Gusev knows the immense amount of effort and dedication it has taken to set up this prize. In fact, the Russian expert ranks the Tang Prize as one of Dr. Yin's greatest achievements over his impressive career.

This will of course be the first year that the Tang Prize is awarded to exceptional achievers, but Dr. Gusev believes it will only become more important over time as it draws ever more attention and contributes to our world. As for the foundation's founder, Dr. Gusev praised Yin as a far-sighted and wise person for his focus on sustainability, what Dr. Gusev described as offering the keys to the future to the people of the present.

Agriculture, water resources, engineering, and related fields are among the most important to our lives, Dr. Gusev pointed out, noting that the award for sustainability will push researchers to explore new directions. He gave an example of pesticides, which improve agricultural efficiency but damage the health of both human beings and our world. Where the Tang Prize comes in is its ability to integrate opportunities in agriculture and chemistry, lighting a new beacon of innovation by encouraging researchers to branch out from their own fields.

One global problem on Dr. Gusev's mind is space debris, which many have largely overlooked despite its major impact on flight safety; one piece of waste carelessly tossed away a decade ago can mean a lot of trouble down the road. The Tang Prize for sustainability focuses not only on existing research, he noted, but on the challenge of using such research to inspire widespread belief in the idea of sustainability. He went on to explain that while many man-made materials like Styrofoam have practical uses in the short term, such as temperature insulation that allows us to save on refrigeration costs, they also end up damaging the environment for years to come.

The importance of keeping the future in mind has lead Dr. Gusev to praise the sustainability award as a philosophically oriented prize that looks to the future to reward man's efforts to live in harmony with nature. We need to look at the state of everything on the planet and not just ourselves, our food, and our clothing, he said, cautioning that the various energy resources we use to sustain our lifestyles, including nuclear energy, are all exhaustible.

There is an obvious inclination to compare the Tang Prize to the long-established Nobel Prize. Dr. Gusev sees a big difference between the two in that the Nobel Prize emphasizes how physics and chemistry change our lives, but it leaves out categories that may have an even greater impact on us like engineering and sustainable development. The two prizes do not overlap, he noted, adding that rather than calling them complementary, he prefers to think of the Tang Prize as representative of a new way of thinking about achievement in research.

Another important aspect of the Tang Prize according to Dr. Gusev is the cross-disciplinary nature of sustainability, which goes beyond more commonly seen prizes for engineering that have narrow focuses such as aeronautics or math. Sustainability as a field represents a new chapter in human development, and he expects it will bring new tools and ideas to engineering. He is proud to have contributed to the field himself, he said, modestly understating his achievements.

He also noted that he has worked to promote the Tang Prize and its spirit in Europe and the Commonwealth of Independent States and expects it only to get better with time. In the event that the first iteration of the prize runs into any unexpected issues this year, he said he is confident that it will improve by the time of the second awards. Just who receives the award itself is less important than its role in encouraging sustainability, he said.

Foundation CEO Dr. Chern Jenn-chuan agreed that the Tang Prize for sustainability aims to inspire discussion of the human impact on the environment in a world undergoing climate change-driven disasters, overpopulation, and shortages of food and water.

He said that Dr. Gusev's remarks spoke to a broad vision and great wisdom and represent a future direction for the Tang Prize to endeavor. He thanked Dr. Gusev's efforts to let the world know about the prize, calling him an "important asset to all mankind." If more can follow in the example of Dr. Gustev and the spirit of the Tang Prize, he said, it will undoubtedly be a major force for good for the future.

Stressedly-deformed state in concrete as in composite material under compressive loads, and rational reinforcement by circumferential steel

混凝土受軸壓之應力應變行為及圍束鋼筋之作用

資料來源：俄羅斯工程院

作者：B. V. Gusev / 國際工程院暨俄羅斯工程院院長、技術科學博士、俄羅斯科學院通訊院士

作者：A. I. Zvezdov / 俄羅斯工程院第一副院長、技術科學博士

作　者：Samuel Yen-Liang Yin / 潤泰集團總裁、國際工程院第一副院長、台大土木系兼任教授

ABSTRACT

This article contains analysis of stressedly-deformed state in concrete under compressive loads, when tensile stresses appear. The method of coil reinforcement considerably decreases these stresses under direct compression.

The suitability of fillers for heavy-weight and light-weight concretes is being tested by crushing tests in cylinder. In the process, it is generally agreed that filler strength for heavy-weight concretes must be 1.5-2 as much as the grade of the concrete. For light-weight concretes of high grades (B22,5 and higher) filler crushing strength in cylinder must not be over 3 MPa. It is often allowed that the ultimate strength and the modulus of deformation are interdependent, which provides the basis of nondestructive testing methods usage. But the reasons of stress concentration in composite materials are the differences in moduli of matrix deformation values, and inclusion of composite materials.

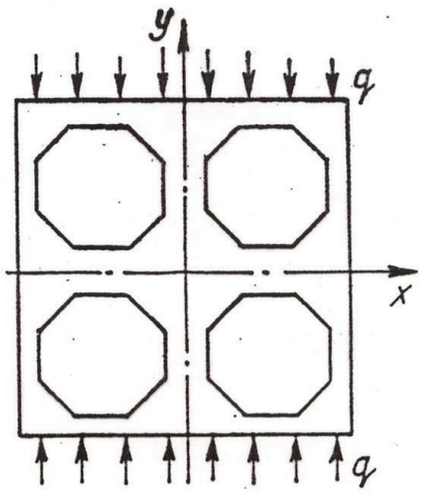


Fig. 1. Calculation model of concrete as of composite material.

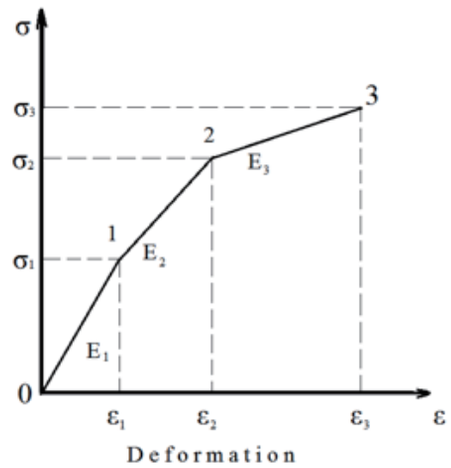


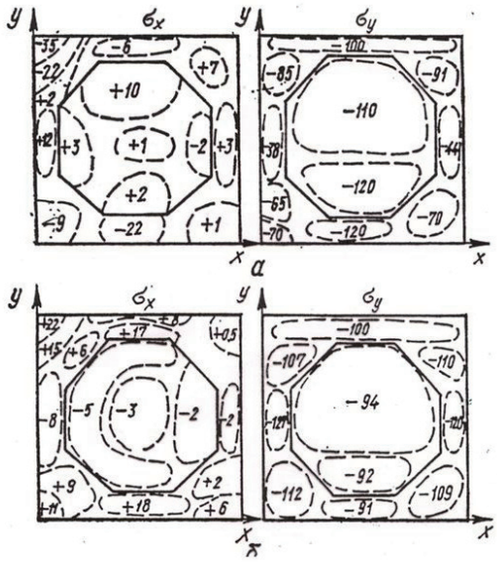
Fig. 2. Type of dependence between tensions and deformations.

Let us consider a model of concrete in which filler is represented as a set of octahedrons evenly distributed in the matrix part of the concrete. The pattern of such composite material is influenced by equidistributed compressive load«q» (fig. 1).

For the stress analysis in the components of distributed load influence we can use finite element method, dividing all the field of the model into triangular elements [1]. The authors of this paper suggest considering a nonlinear dependence between tensions for various components of concretes and for concrete materials. For such purposes during the usage of finite element method, a simplified methodology of calculation by iteration method of nonlinear dependence between tensions σ and deformations ε was created and is being used. Such nonlinear dependence takes place in real materials (fig. 2).

Nonlinear dependence may be represented as a polygonal chain, e.g., 0-1-2-3. In the 0-1 part the ultimate stress will be σ_1, the ultimate strain will be ε_1; in the part 1-2 σ_2 and ε_2, respectively.

Iteration method is a method of successive approximations. Originally, in calculations, the elements belonging to the given component were given coefficient of elasticity E_1. If it comes, after complete calculation, to the result when in one or in a number of elements tensions or deformations exceed limited values of σ_1 or ε_1, this element is given a new value of coefficient of elasticity E_2, equal approximately $(0{,}5\text{-}0{,}6)E_1$.



a – if filler coefficient of elasticity ratio to mortar component coefficient of elasticity Eb/Em = 3; b – if ratio Eb/Em = 0.7; area borders with equal tensions are shown by hachures, tensile stresses are shown by «+», compressive stresses are shown by «-».

Fig. 3. Fields of value distribution of horizontal σ_x and vertical σy tensions from external load with intensity q = 10 MPa for ¼ of the concrete calculation model.

The calculation is being checked without increase of the load. If in the issue of the redistribution of tensions or deformations, in new elements, tensions or deformations exceed σ_1 or ε_1 respectively, this element is also given a new value of coefficient of elasticity. The external load is gradually increased, after each calculation the stressedly-deformed state of the model is analyzed. If in the element which is originally given the value of coefficient of elasticity E_2, tensions of deformation appear exceeding σ_2 and ε_2 respectively, this element is given a new value of the coefficient of elasticity E_2, which is near-zero, i.e., it is supposed that the destruction of the element occurred, so the element is practically taken out from the work of the model.

The accepted simplified methodology of calculation of the nonlinear dependence between tensions and deformations makes it possible to retrace the change of stressedly-deformed state of the concrete model down to its complete destruction. The flat calculation model of concrete as a composite material with four inclusions is represented on the fig. 3.

In the performed calculations, the ratio of the coefficients of elasticity of the inclusion Eb and the matrix Em varied within Eb/Em = 0.5…0.9 and Eb/Em = 2…4. The ratio of inclusion volumes to the general volume of the concrete varied within 0,35-0,45. The shape of the inclusions was taken round, polyhedral and rectangular with different angle orientations with respect to external load direction.

Of the three structural factors, studied within mentioned limits, the greatest influence on the stressedly-deformed state and the ultimate strength of concretes is exerted by the ratio change of the coefficients of elasticity in the filler and in the mortar component (fig. 3).

Stress concentration zones and the absolute magnitude of the latter considerably depend on the ratio of coefficients of elasticity of inclusion and of matrix. When the coefficients ratio is Eb/Em>1, the type of the tension field is similar to that represented on the fig. 3a. When the ratio is Eb/Em<1, the type of the tension field is similar to that represented on the fig. 3b. Following the change of ratio of these coefficients of elasticity, the tensions are measured only by the absolute magnitude.

The concentration of tensile stresses from the ratio of coefficients of elasticity is of special interest: 1 – at Eb/Em = 0.9…0.5; 2 – at Eb/Em = 2…4, as the ultimate tensile strength of concretes and their components is by a factor of ten lower than compression resistance.

The analysis of model calculation results for heavy- and light-weight concretes makes it possible to determine the following main regularities of creating a structure with maximal usage of mechanical properties of the components.

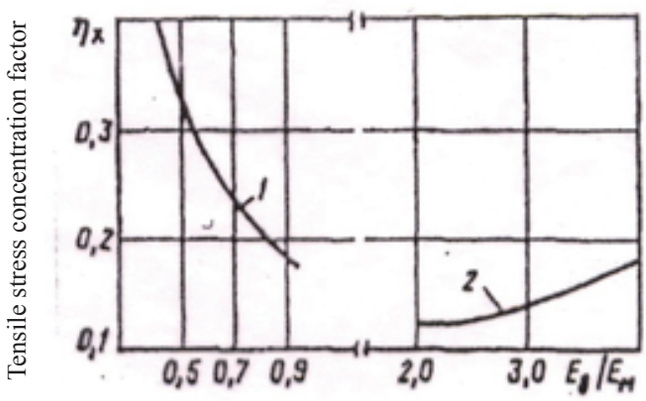


Fig. 4. Diagrams of dependence of notch sensitivity index η from the ratio of coefficients of elasticity

For heavy-weight concretes it is most reasonable to use components with ratio of coefficient of elasticity and matrix Eb/Em = 2…3. The higher ratio of coefficients of elasticity significantly increases the concentration of the most dangerous tensile stresses.

The usage of fillers like expanded clay is not reasonable as their coefficient of elasticity is lower than 0.7 of the coefficient of elasticity of the mortar component, because in the process the concentration of tensile stresses increases significantly.

The volume concentration and the shape of the coarse aggregate don't make significant influence on stressedly-deformed state and the ultimate strength of the concrete, so they may be chosen according to economical reasonability.

Concrete is a composite material which consists of components various by their deformation properties, besides this, it has considerable porosity ranging from 2 to 6 per cent. With such characteristics, under the influence of compressive loads in such materials, tensile stresses appear. In this paper it is shown that tensile stresses in the plane perpendicular to the lowering one may reach 40 per cent from the load value. At the same time it is known that in fragile materials (such as concrete), the ultimate tensile stresses total just from 5 to 10 per cent from the compressive stresses.

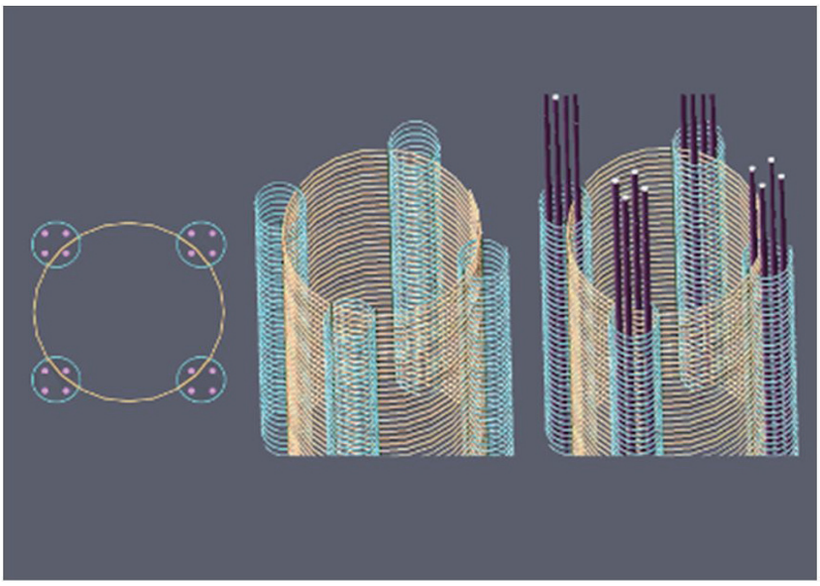


Fig. 5. Three-dimensional concrete reinforcement by coil reinforcement steel

So, about 30 per cent of all the amount of concrete in construction is being prestressed. Let us consider a biaxially-reinforced plate 24 meters in length, 5 meters thick. Prestressing of the plate far and wide makes it not just flexible, but provides the increase of concrete density. Nonetheless, prestressing with reinforcement is rather complicated and expensive process.

Another well-known example of construction carrying capacity increase is pour in pipe. In that case, the pipe receives inner tensile stresses in concrete, and tensile load is transmitted to and received by walls of the pipe. The same effect may be obtained during the spiral reinforcement according to the technology by S. Yen-Liang Yin.

In the paper [2] it is shown that concrete can be rather efficiently reinforced with spiral reinforcement. In the process, compressed stress in concrete is provided, and tensile stresses can destroy only the protective part of the construction down to armouring, keeping the construction in the whole in operating condition. On the fig. 5 it is shown a reinforcement of a column in the shape of a coil or a number of coils in the corners of the column. The same coils may exist at rectangular, ellipsoid and other cross-sections of the column.

On the fig. 5 there are some examples of «tension-deformation» for different types of reinforcement.

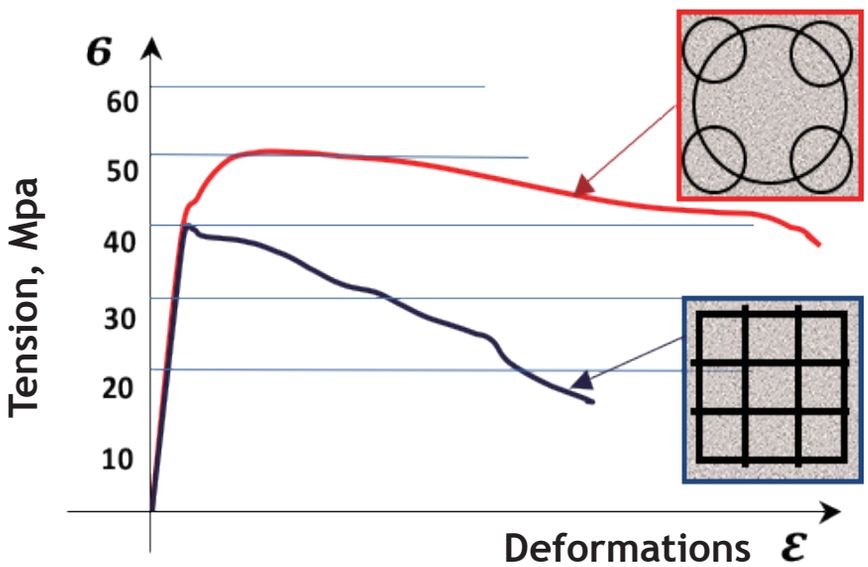


Fig. 6. Carrying capacity of column fragments with different types of reinforcement.

It should be mentioned that there was created simple coil equipment of any diameter, thus showing that a simple idea can be a work of genius. So, one can say that preconditions for development of a whole area in providing of concrete three-dimensional reinforcement are created.

On the fig. 6, dependences of «tension-deformation» for various types of reinforcement are shown. With the usual reinforcement, the column quickly collapses (Diagram 1).

Despite of the fact that the rate of reinforcement is high and two times as much as the version with coil reinforcement, the carrying capacity of columns with coil reinforcement will be considerably higher. Interestingly enough, that on the diagram 2 the column with coil reinforcement keeps its carrying capacity for a long time with further deformation process.

On the fig. 6 it is shown that coil reinforcement doesn't make it possible for concrete to collapse inside the circumferential reinforcement.

The construction of making reinforcement cages, described by S. Yen-Liang Yin in his works, is marked by simplicity and singularity.

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Low intensive laser stimulation as the effective method for improvement of disturbed accommodation and prophylaxis of myopia advance

以低強度雷射法預防及改善眼睛近視

資料來源：俄羅斯工程院

One of the main factors inducing development of myopia is weakening of the accommodation ability of the eye accompanying myopia advance in children and teenagers and very frequently precedes myopia occurrence.

A method of transscleral laser therapy is directed to improvement of accommodation and normalization of the functional ability of ciliary muscle. The effect of low-energy IR-laser irradiation (the wavelength is 1.3 μm, MACDEL-09) increases metabolic activity ciliary body cells and the eye hemodynamics is improved.

In 1992-1994, clinical tests were performed on 68 children aged 7 – 17, with progressive myopia within the range of 0.5 − 3.0 D. The average increase of accommodation reserve per day of laser therapy equaled 0.3 D. This increase was slowed down between day 7 and 10, giving 0.1 D per day.

The increase of relative accommodation reserve in teenagers and elder children was noticeable since day 3 of laser stimulation. In younger children, the increase was slower, and the relative accommodation reserve increased since day 4 - 5.

A significant shift of **the nearest point of clear vision** was observed for children aged 13 - 16 eye approach by 1.27 cm (equivalent to 2.4 D), for schoolchildren aged 10 - 12 the eye approach by 1.16 cm (2.2 D) was observed. Slightly shorter approach of the nearest point of clear vision was observed for schoolchildren aged 7 – 9: 0.94 cm (0.7 D).

In all cases, laser therapy caused average increase of **rheographic coefficient** from 2.07‰ to 3.44‰ which indicated a reliable increase of blood filling of vessels in the ciliary muscle e.g. ciliary muscle perfusion and function are improved.

The indices obtained are preserved during 3 months after the course implemented and decrease 5 - 6 months after the treatment, but remain higher than before it. The repeated course of treatment allows for normalization of these indices.

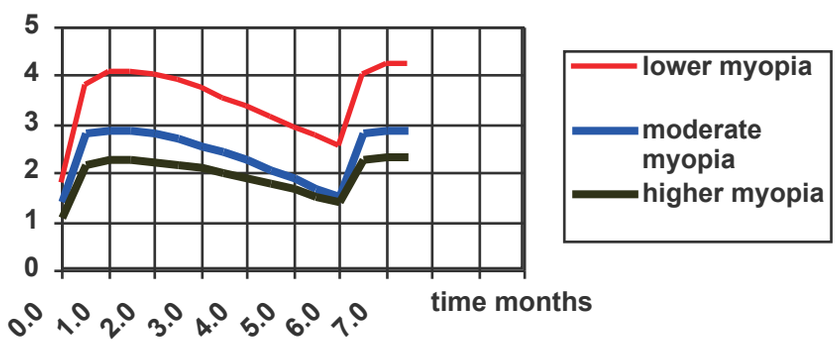
The method is included to the system of measures for myopia prophylaxis and treatment, applied in Helmholtz Research Institute of Eye Diseases. Since 1993, therapeutic treatment by MACDEL-09 device (2 courses per year) was applied to several thousand patients with myopia. Many therapeutic institutions in Moscow and other Russian cities are equipped with these devices.

The tactics for transscleral IR laser stimulation of the ciliary body is developed: the treatment course consists of 10 daily sessions and is repeated every 6 months during 3-5 years. The indication for current treatment is slowly progressing (below 0.75 D/year) lower, moderate and higher myopia in patients 7 – 30 years old. Rapidly progressing myopia (above 0.75 D/year) requires treatment implementation, most often combined with sclera-strengthening procedures.

No signs of irritation of the ciliary body, external eye shells, as well as damaging impacts on retina and visual nerve were observed. The last statement is confirmed by functional (perimetry) and electrophysiological studies carried out in 15 patients, randomly selected from the group of treated patients.

Thus, the method of transscleral laser stimulation using MACDEL-09 device is the effective measure for myopia advance prophylaxis. The method can be used in dispensaries. It is tolerable for patients and easy to implement by the intermediate medical staff and optometrists.

Dynamics of accommodation reserve variation



Dynamics of refraction at long-term observation

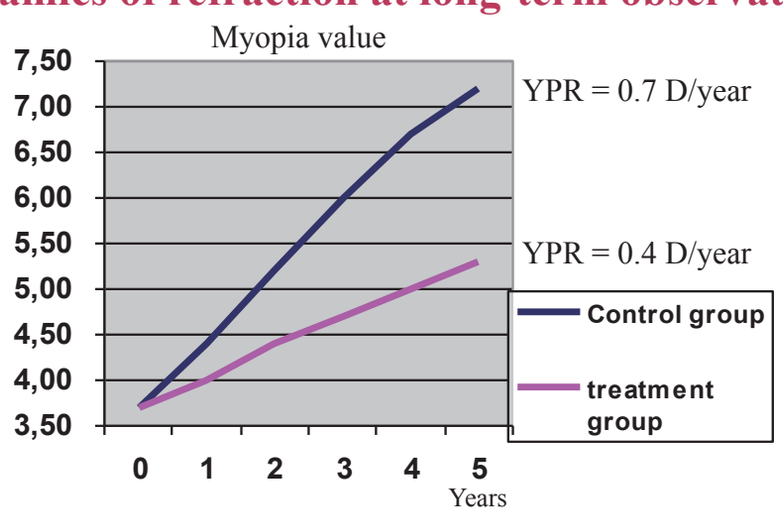


Diagram one clearly shows that at lower myopia e.g. at its timely detection, the advance of it is not only stopped, but the initial indices of vision can be improved. At higher myopia, its advance can be stopped.

Diagram two presents results of long-term observation for patients with much higher initial myopia (above 3 D). For treating the control group, totality of the methods for myopia treatment, optimal for the current moment, was used. For the treatment group, MACDEL technology was used. A considerable difference in treatment results allows for

accepting the MACDEL technology the most effective therapeutic method. This will help in saving many problematic patients from disability and arise the question about considerable, by an order of magnitude or higher, decrease of the number of patients with myopia at the establishment of vision monitoring and prophylaxis service.

Potential users of this technology is about 35 − 45% of the population of every developed country.

A set of laser ophthalmology devices for therapeutics and prevention of vision disturbances

The medical technology for treatment and prevention of vision disturbances results from the fundamental researches implemented in Helmholtz Moscow Research Institute of Eye Diseases. It comprises techniques for treatment and a set of devices providing for laser effects.

IR laser device for therapeutics of accommodation-refraction vision disturbances

The device effects on the ciliary muscle, laser radiation does not hit the eye.

Treatment and prevention of myopia, amblyopia, nystagmus, heterotrophy, eye fatigue, rehabilitation and preventive maintenance of post-operation complications of ceratorefractive operations.

The efficiency of preventive maintenance of children's and adolescent myopia exceeds 90 % that solves the problem of myopia by preventive measures. The treatment comprises 10 – 12 procedures, 3 – 5 minutes long each.

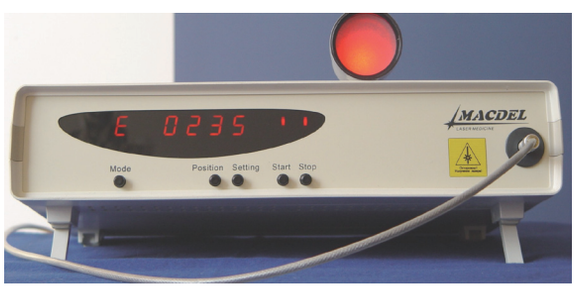
The therapy results are preserved during 4 – 6 months.

The application in a complex with MACDEL-00.00.08 device and usual ones is recommended at the treatment by eye trainings.

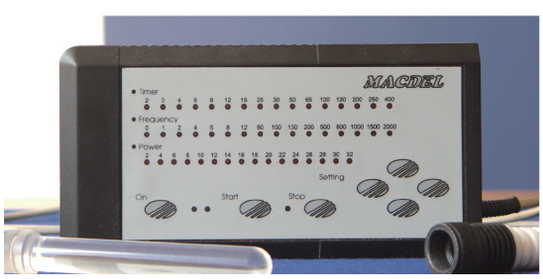
Radiation penetrates through transparent media of the eye and hits retina.

Indications are the same as for MCDEDL-00.00.09 application, but accents e.g. amblyopia, myopia, eye fatigue, posttraumatic rehabilitation, cornea metabolic diseases, lachrymal gland dysfunction, etc.

MACDEL-00.00.09



MACDEL-00.00.08



MACDEL-00.00.02

The treatment consists of 10 - 12 procedures, 5-10 minutes long each. Therapy results are preserved during 4 - 6 months. The presence of optical socket located in front of the screen allows the device application to treatment of lachrymal gland dysfunction and supporting reflex therapy. Higher average power (7 – 8 mW) of the device versus the analogues provides the adequate dose for the patient during reasonable time.

Applied as a component of an ophthalmologic complex, the device is intended for treatment of herpetic eye diseases and their aftereffects, allergic and trophic ceratitis, recurrent cornea erosions, ceratoconjunctivitis, ulcerous blepharitis, lachrymal gland dysfunction, cataracts, and glaucomas. The laser effect on cornea is combined with laser puncture and drug therapy.

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INTRODUCTION

撰文 / 黃怡瑛

俄羅斯國際工程院、俄羅斯工程院與台灣分會自2009年建立良好互信關係以來，始終不斷嘗試並積極在下述領域進行合作，包括：

- 共同開發創新計劃、製造標準技術性產品、進行教育性活動；
- 針對技術與科技領域方面的各種問題，進行研討會、論壇及諮商的工作；
- 在俄羅斯國際工程院、俄羅斯工程院及台灣分會三方的協議合作框架下，幫助台俄雙方各大專院校建立校際合作關係，包括教授、研究生及大學生的交換計劃等；
- 協助俄羅斯及台灣的學術機構 / 研究人員，申請政府部門與基金會的經費補助（台灣 - 科技部；俄羅斯 - 俄羅斯基礎科學基金會、俄羅斯人文基金會、俄羅斯科學院西伯利亞分院、俄羅斯科學院遠東分院），共同進行台俄雙邊研究計劃；
- 以俄文、英文、中文形式出版各種工程活動的專書及手冊，並包括工程院內有名之學者及工程師的傳記等；
- 技術及工程領域方面之教科書的撰寫工作，亦或各別大學之課程的設立，並與各大學（即俄羅斯國際工程院的團體會員）協議，以英文、中文及俄文形式出版；

- 在互利的基礎上，建立技術、醫學（藥學）及顧問活動領域的合資企業，包括開發共同專利，以吸引俄羅斯及台灣的企業及組織；
- 每年進行俄羅斯及台灣 1 至 2 次的互訪活動。接待安排台灣代表團訪問俄羅斯（包括其他獨立國家國協成員），邀請並參加俄羅斯或其他獨立國協成員國所舉辦之研討會及論壇；
- 科技發展的主要領域方面，以較為迫切及具前瞻性的問題優先開發共同研究計劃；
- 籌組開發研究團隊，領域包括：由有機廢料取得生物氣體之研究、建物剩餘壽命的研究、使用陶瓷及其他材料之過濾器所作的淨水處理；研究 2015-2020 年科技及工程發展較具前瞻性的領域，並準備共同發展計劃，領域包括：評估物體狀態的雷射掃描技術、奈米結構材料的粉末、加熱及冷卻的有效系統、開發防火合成材料等。

上述皆為總院與台灣分會所積極努力的工作項目，今年俄羅斯方面亦提供五項合作計畫的詳細資料內容，歡迎有興趣的相關企業、研究單位進行合作，意者請洽本會。

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BIOGAS REACTOR

ABSTRACT

The technology implements obtaining synthesis-gas by deep processing of organic raw material, including technological wastes, by physical methods. The new solutions are based on the method of catalytic hydrocracking of liquid biomass under high pressures and critical thermodynamic conditions. One of the perspective usages of reactor is efficient utilization of liquid organic wastes (washouts) of nuclear power plants.

PURPOSES OF THE PROJECTS

= creation and certification of experimental-industrial installation of deep processing of wastes of agricultural production (liquid organic mass);

= organizing of design and cooperative production of energy installations based on biogas reactors;

= organizing joint business in the field of renewable energy sources on the basis of environmental friendly energy-saving technologies of utilization of organic waste.

PROPOSALS FOR FOREIGN INVESTOR

- Creation of joint enterprise for completing design;
- Organizing production of biogas reactors and energy installations on their basis;
- Sale of product.

* Volume of investments in the pilot project on creating pre-serial model with capacity is $1 - 3 million. The project is now on the stage of laboratory testing of prototype and is ready for implementation.

* Volume of Russian market is estimated $960 million annually during five years (500 installations of Biogas reactor).

The project is proposed by International Academy of Engineering (IAE) in cooperation with Taiwan Chapter of IAE.

BIOGAS REACTOR

Biomass is virtually inexhaustible heat and electric energy source for humanity for the next few centuries. At the present time, the main way of processing of liquid organic wastes is implemented in biogas technologies. As a home-grown method it has been known for thousands years. During last decades, it obtained completed hardware design. Unlike the other ways of biomass utilization, it does not require preliminary drying. During the fermentation process, biogas is being formed (mixture of methane and carbon dioxide). Among the drawbacks of this method are: a) long period of fermentation (about one month), which prevents from creating compact high-productive installations; b) small, usually not over 20%, level of usage raw materials for obtaining biogas, with putting the rest of organic mass of waste to the fields; c) high prices of making installations and high operational costs; d) principal absence of opportunity of complete utilization does not solve the problems of environmental safety.

A new class of compact high-production equipment on the basis of physical-chemical processing of biomass with catalytic hydrocracking method is being developed. Such method makes it possible to efficiently use, in environmentally safe way, natural biological substances such as peat and algae, to completely recycle liquid and semi-liquid organic animal waste, poultry waste, wastes of paper-making, hydrolysis and food industry, as well as other types of organic raw materials for production of fuel gases, heat and electric power. The capacity of such equipment may be from 5 to 2,500 m^3 per day, and produced electric power, respectively, from 0.1 to 50 MW, what makes it possible to solve ecological problems of any agricultural enterprises.

In comparison with well-known biogas installations, the new equipment is dozens times smaller, and may be placed in 20- and 40-feet sea containers (mobile version), without requirements of big room; the new equipment is also has considerably lower cost (from three to ten times). The equipment operation does not require external heat, electricity and other technological supply, i.e., it is carried out in completely autonomous mode with remote control through cell or satellite communications. The products obtained during the processing are technically pure water, minerals in kind of ash, and fuel gases w/o sulfur. These products are not dangerous and do not have any harmful influence on the environment.

The principle of the equipment operation is thermochemical processing of waste under high pressures with further separation of products onto organic component (fuel gases and CO_2), technically pure water and mineral substances (organic fertilizers and ash).

Nowadays, an experimental installation with production capacity 5 m^3 per day is being built. For the completion of research and development work, investments are required about $3 million. The price of series-produced biogas reactor with capacity 25 m^3 per day may be up to $1.8 million.

莫斯科地鐵

WASTE RECYCLING: A SOCIAL PROBLEM

(From a marketing report not for publishing)

Actuality of the work

Livestock breeding complexes and poultry enterprises nowadays face serious problem of manure and other wastes recycling, including wastes of slaughter. One hen produces about 0,6 kg of manure per day, one pig produces about 12 kg of manure, and one cow produces about 60 kg! Experience shows that an average-size cattle farm (4,500 heads) produces about 175,000 tons of manure flows per year (or 500 tons per day), even with washing. One average poultry farm (40 thousand laying hens, or 10 million broiler chickens) annually produces from 35 to 83 thousand tons of manure and over 4,000 thousand m^3 (or 1,100 tons per day) sewage waters with high concentration of organic components. Most enterprises still place waste flows to the reservoirs, where they undergo separation onto liquid and solid parts, and then they are being put as fertilizers to the fields. Some other enterprises send waste to the closest city purification plants, if they are exist. Another problem is disposal of remnants of dead-off animals, number of which sometimes reach 8-9% of total stock of cattle breeding enterprise.

The requirements for processing and recycling of wastes of livestock breeding enterprises are given in Technological design standards NTP-17-99. These standards are rather strict, and not always implementable. For example, in the NTP-17-99, the time of holding of manure in the reservoir is mentioned as at least 6 months. Cattle farms with livestock over 4,500 heads, producing 175,000 m^3 of liquid manure flows, must have for storage and recycling of these flows at least 7 reservoirs with capacity 12 thousand m^3, filling by turns, with general area about 20 thousands m^2. After filling the seventh reservoir, 6 months of keeping flows in the first reservoir will pass, and necessity of its emptying will appear.

The same standards NTP-17-99 prescribe that liquid manure from the reservoirs may be put to the same field not over 1 time per 4 years; otherwise it may be a risk of salinization of soil with nitrogen compounds. Besides this, liquid manure, poured to the fields, must be treated with disk cultivator in two hours at the latest, to avoid contamination of air. For emptying of one reservoir with an 11 m^3 tank, 1,091 runs, or 409 working days will be required. Using four tanks simultaneously will require not less than 3.5 months. Filling of one reservoir with flows takes 3 months; only the cost of transporting of processed flows to the fields and burying them into the ground will be about 1 million rubles annually.

It should be mentioned that in any case, the owner of the enterprise, to match with the mentioned standards, will have to build concrete reservoirs, keep a massive staff of trucks and workers (or invite transport companies). Besides this, the areas necessary for concrete reservoirs, actually, are being excluded from the agricultural usage.

Total area of agricultural ground, assigned for manure storages, according the preliminary estimate of the Ministry of Agriculture of Russia, is 5,000,000 (five million) hectares.

Cost of recycling of wastes of agricultural enterprises of agricultural sector is 450 rubles per ton, cost of recycling of wastes of oil-producing and oil-processing enterprises of Russian Federation varies from 1,000 (one thousand) rubles per ton, to 4,000 (four thousand) rubles per ton.

With annual accumulation in Russian Federation of wastes of cattle breeding and poultry in volume of 5,000,000 tons, the amount of money spent for these wastes recycling must reach 2,250,000,000 (two billion 250 million rubles per year). This number is given without account of wastes already kept in storages (roughly speaking, the above-mentioned number should be increased at least two times).

Besides the issues of the ecology on the agricultural complex enterprises, there is the issue of recycling of oil-slimes accumulated on the territory of Russian Federation. The amount of these oil-slimes, according to the estimates of EMERCOM of Russia and of Natural Resources Committee of Russia, is from 50,000,000 to 500,000,000 tons. The study of possible usage for combined utilization of these components as fuel oil is also a topical task.

Wastes of oil companies accumulate for decades, and should be considered as a separate ecological factor, influencing on the environment. The supposed costs for disposal of these wastes with traditional technologies reach vast sums of money.

The necessity of recycling of big volumes of biomass wastes in agriculture (straw, rot), food industry (alcohol grains, brewing waste, hydrolysis waste etc.), paper and wood processing industry etc should be also mentioned.

At the present time, there is no other technology available in the world, which makes it possible to recycle and dispose of liquid organic wastes more efficiently than traditional biological method.

The new technology which is being developed by the Russian Academy of Engineering, is based on the usage of physical-chemical methods, namely, of supercritical fluids, makes it possible to dispose of manure flows immediately after their forming (during 10 minutes) instead of 6 months of their keeping in reservoirs and further putting to the fields. The equipment is compact and is produced in mobile versions.

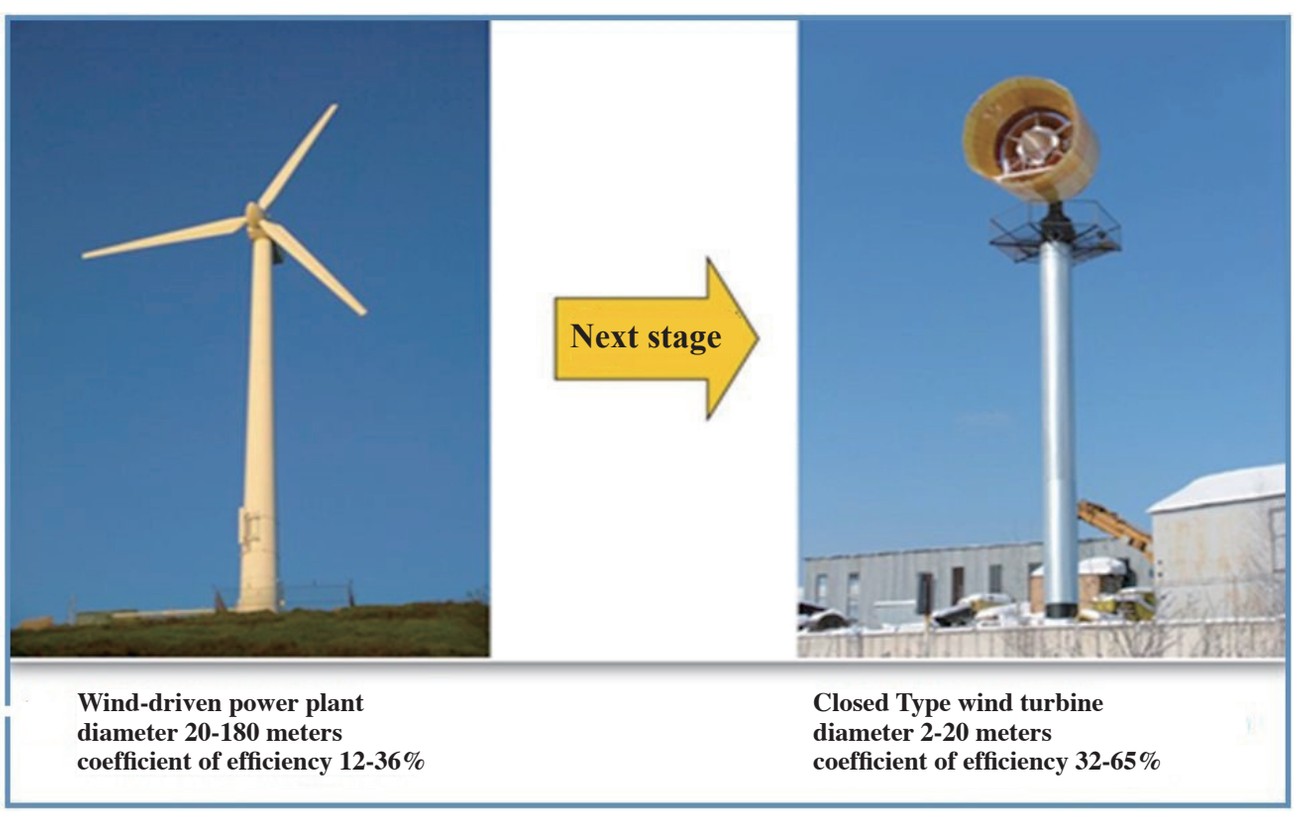
More detailed analysis may be found in the works of «All-Russian Scientific Research Institute for Electrification of agriculture – VIESKH» and All-Russian Institute for cattle breeding.

Note. *As the estimates show, for the solution of the issue of liquid agricultural wastes recycling, hundreds of mobile installations are required, with feed capacity from 25 to 250 tons per day. As a bonus, farms may get hot water, fuel gas and electric power from the processed wastes. All this is independent subject for business incentive.*

Conclusion: From the business point of view, the new technology is rather topical, and the market is virtually unlimited.

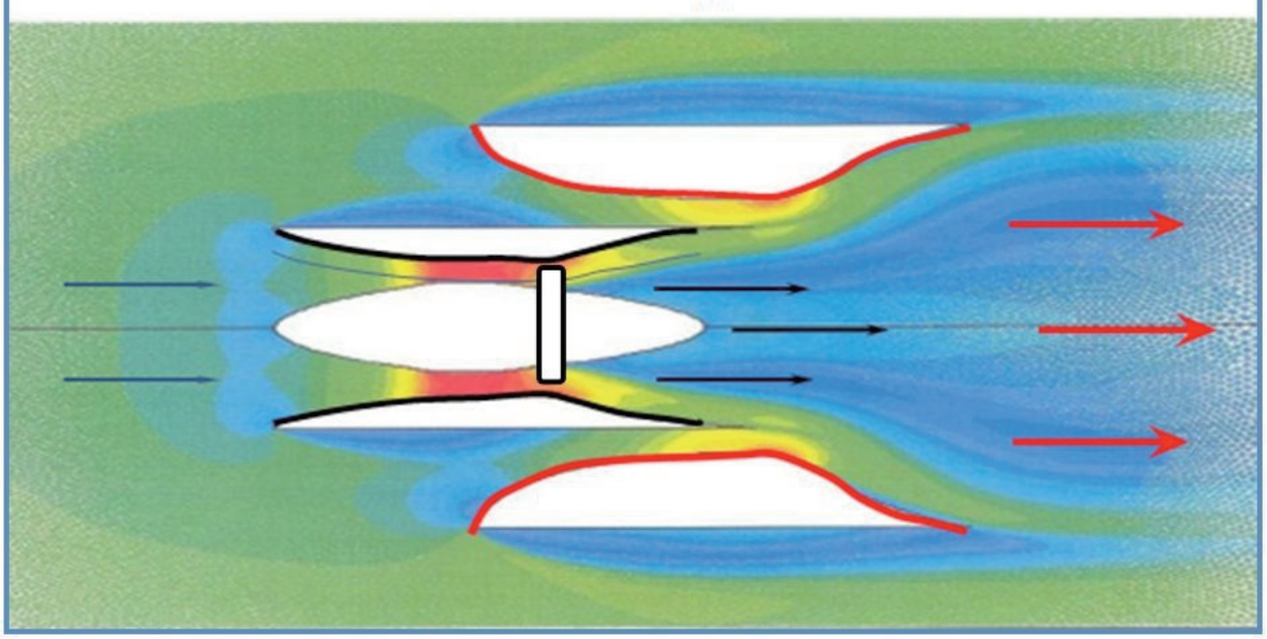
CLOSED-TYPE WIND TURBINES

Efficiency of usage of wind power as renewable energy source is universally recognized. At the same time, traditional series-produced constructions, blade wind-power installations have some principal drawbacks, of which the main ones are considerable mass-dimensional parameters, existence in the range of dangerous for man and for animals infrasonic oscillations, considerable territories for providing technical efficiency and safety, technological complicatedness of operation and production.



The technology of **closed-type wind turbines**, developed under the direction of A.I.Ovchinnikov, is based on fundamental thermodynamic principles. The installation represents a completely new generation of up-to-date wind turbines, radically different from traditional wind power plants by higher operational characteristics, operational effectiveness and ecological/technical safety. Acceleration of air stream in Laval nozzle and sail-formed configuration of turbine blades make it possible to increase power transfer coefficient of kinetic energy of wind and its energy intensity. The absence of multiplier in the installation and usage of low-speed valve-inductor generator considerably increase the integral figure (coefficient) of usage of wind flow.

Closed type wind turbine: increasing kinetic energy of wind due to potential energy of flow in nozzle



Benchmark and full-scale tests with usage of up-to-date spatio-temporal instruments of estimate of resource indicators of structural dynamic strength, designed by the International Academy of Engineering (IAE) **prove high innovative potential of the work and features of "closing technology".**

Closed-type wind turbine has high-level technological characteristics:

= possible for installation in living areas, for mounting on houses and industrial structures;

= high power capacity with equal diameters;

= higher service life without components change, very low noise level, no infra sounds and radio interference, no radio wave screening;

= no open moving components, no visual irritation, minimum discord with landscape; may be used in conservation areas and in parks;

= no reducer, no parasitic components, may be mounted without masts, by «package»;

= self-orientation to wind, may be used during winds over 25 meters per second, resistant to wind blasts, whirlwinds and turbulence;

= accessible and affordable, easy to change materials; easy to repair and to upgrade;

= low prime cost and maintenance charges;

The project is being presented by International Academy of Engineering (IAE) in cooperation with Taiwan Chapter of IAE.

NANOCOMPOSITE HEAT EXCHANGERS

There are practically tested technical methods for generation and supply of heat for customer. These methods make it possible to sharply reduce losses of centralized heat supply. Among their qualities which have already been proved, are reliability, easy way of usage, much lower accident rate (many times lower), much lower prices of the heat energy for people.

Heat system with low level of heat energy losses has been developed. **This system is based on tubeless energy-saving nanocomposite convectors**, designated for up-to-date heat systems and systems of hot-water supply, for providing population with heat with maximum comfort and with much lower rate of accidents. Convectors (heat exchangers) are developed on the basis of advanced aviation technologies with unique performance parameters:

= Minimum specific weight on 1 kilowatt of heat power. Volume of heat exchanger is 2 – 5 times smaller than that of typical constructions.

= Heat transfer coefficient is 40-70 W/m², what is twice higher than traditional ones. Thermal utilization factor increases from 12% to 45%. Generating capacity of the individual boiler is 40% lower.

= Minimum inner volume of filling by the heat carrier: heat exchanger with power 1 kW is 0,5 litres in volume.

= Working pressure is 5 – 10 times higher than traditional ones. Standard is 60 atmospheres. Convector is resistant to water hammering, to mechanical impact loads.

= Enegry-saving nanocomposite convectors are not being defreezed in a set with metal polymeric pipes and fittings of special structure.

= Service life increased to 25 years.

= May be used in corrosive mediums.

= Highest coefficient of efficiency for convectors (over 90%).

= operating temperature up to 700 C^{o}.

Designated for energy-saving heat systems during capital repair and construction. Without temperature reduction in the room, costs for heat-carrier warm-up is 30 – 60% lower!!!

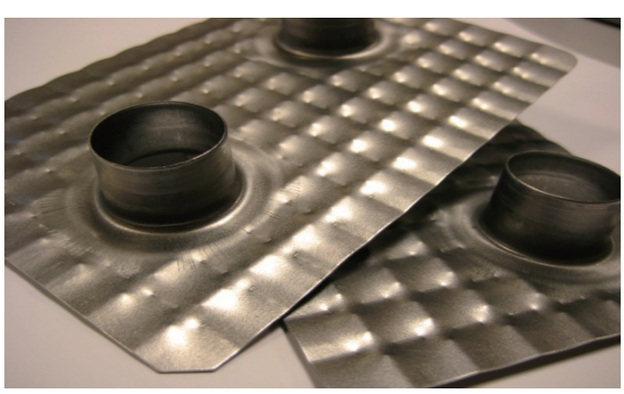
Pipeless construction of energy-saving nanocomposite convectors supposes usage of inexpensive packaging steels 08KP for bulk forging, treated by special coverage of copper soldering paste.

= Energy-saving nanocomposite convectors are recommended for usage on moving objects. Convector may work in all positions, it is resistant to vibrations and impact loads. May be used as load-bearing element of product's body.

= May be used with any type of boiler houses, domestic boilers and heat carriers.

= Production is 90% automated. Small amount of operations. Minimum personnel and minimum technological equipment required.

= Energy-saving nanocomposite convectors have the least prime cost of production.



The elements are being sintered by the light soldering method in furnaces.

Briefly on production technology: Nanocomposite heat exchangers are made from steel ribbon 0,5-2,0 mm by the method of thin-plate closed-die forging with "high" stretching-out of channeling cones. Then they are being put into packages, depending on type of product, and are being soldered by soldering flux based on copper oxide by the "bright soldering" method in special furnaces with restorative and protective atmosphere.

Designing and making of the Energy-saving nanocomposite convectors complies with most up-to date trends of interior design.

Energy-saving nanocomposite convector in Hi-Tech style may be suitable for any style of interior and construction according to requirements of designer. Exterior of the heat exchanger may be simply modified or transformed by the change of decorative cover.

The project is being presented by International Academy of Engineering (IAE) in cooperation with Taiwan Chapter of IAE.

ROTOR ELECTRIC POWER INSTALLATION

ABSTRACT

Russian scientists, constructors and technologists designed and industrially tested perspective technology based on rotor engine-gas-generator and power expansion machine with electric generator on a shaft. The power plant includes stabilizing inverter, system of spatial monitoring of dynamic strength of power machines and ceramic membrane system of full purification of exhaust. With the similar power capacity, rotor engine (Vankel) has two times lower weight than Diesel engine. In comparison with free-piston engine with similar fuel consumption, rotor engine consumes less machine oil, has longer working life, easier to operate, dynamically balanced, has less impact on environment.

Maximum fuel combustion pressure in rotor-engine gas generator exceeds the combustion pressure of usual free-piston engine, where pressure is limited due to presence of connecting-rods and bearings of crankshaft, and due to unfavourable distribution of forces in top dead center of piston in fuel combustion cycle. Rotor engine has high frequency of rotation, has no dead centers (halts in the process of operation), its main purpose is to provide necessary amount of gas with high temperature and pressure at the entry of expansion machine. Frequency of work cycles of fuel combustion reaches 10000 cycles per minute of 160 cycles per second.

In comparison with electric power plants based on gas Capstone type mini-turbines with capacity 30KW, rotor power generating installations with yearly output over 1500 units may have advantage in price up to 15-20 times. With taking into account of complicated and expensive service regulations of gas turbine machines, Rotor power installations even more cost-saving. But the main

advantage is that **efficiency of Rotor power installations may be 2-2,5 times higher** than the best gas mini-turbines have, and this efficiency reaches 60%.

Industrial models of Rotor engine-321 have been designed, patented, made and tested. A module has been made with injection system, which makes it possible to design 1,2,3 and 4-section engines where parts and units are unified up to 85%; these engines are possible for adaptation for any **energy, aviation, ship and automotive equipment** without changing main parts of rotor engine. A range of engines with variety of power capacities has been designed; these engines are made on unified sections with useful capacity 149, 349, 654, 981 cm3, which makes it possible to get engines with capacity from 10 to 1000 horsepowers. Considerable work have been made to implement new innovative technologies and materials for cost reduction and increasing of engine parameters in cooperation with Russian machine-building centres and enterprises, which makes it possible to develop up-to-date engine branch, having no European analogues.

Rotor engine (base IV RD-321)

1. Area of application

- various purpose flying vehicles

2. Advantages of Rotor engine

The main advantages of Rotor engines in comparison with free-piston engines of existing types are:

- small specific weight and small size of engine
- smaller labour-intensiveness for making
- low vibration level
- low labour-intensiveness for service

3. Short description of engine design

Differences in operation principles of rotor engine and free-piston internal combustion engine.

Main difference in operation principle of rotor engine from free-piston engine is the absence of reciprocal motion. Fid. 1 shows main differences in both operation principles and designs of rotor and free-piston engine.

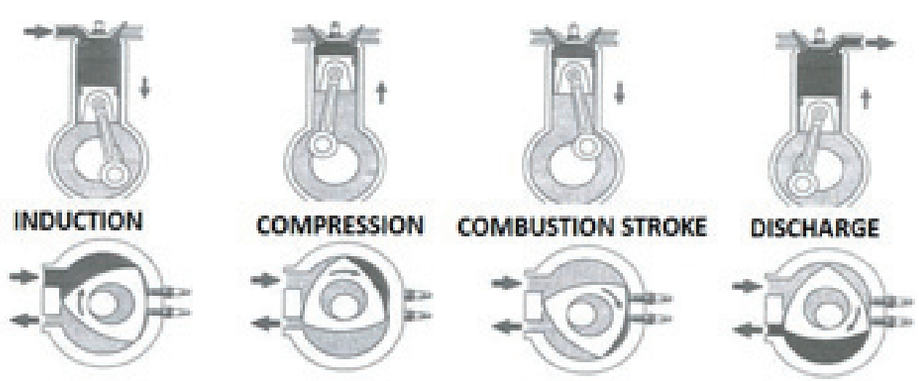


FIG.1. OPERATION PRINCIPLES OF ROTOR AND FREE-PISTON ENGINE

4. Main components of the engine and its systems

- engine body
- rotor-eccentric mechanism
- driving gears of component units
- nlet and control system

ANALYTICAL INFORMATION

The engine Rx-8 Mazda, with production 300.000 units per year, costs $15,5 thousand. The estimated cost of Russian Rotor engine is: two-section Rotor engine-321 (RD-321) with production 15.000 units per year is $5,7 thousand (150-230 horsepowers); three-section RD-331 with production 3000 units per year is $7,2 thousands (250-330 horsepowers); RD-341 and RD-345 are being developed, 4-section version V~2.6 litres, N=400 ÷ 450 horsepowers.

In USA, works were held on creation of Rotor engine of high capacity up to 3000 horsepowers with specific weight 0,8kg/horsepower for U.S. Navy, in diesel and gas versions, but since 2003 these works have been classified as secret. China has begun development of Rotor engine for armed forces, over 100 scientific-research institutes are participating in the project.

BUSINESS PROPOSAL

Organizing certified series production of variety of Rotor engines of various purpose and integration.

Project is presented by International Academy of Engineering (IAE) in cooperation with Taiwan Chapter of IAE.

WAVE MONITORING OF STATE OF STRUCTURES

ABSTRACT

Russian scientists developed and implemented in the industry a universal **information technology** of reliable monitoring of physical parameters of current durability operation life.

The technology makes it possible to carry out direct and real-time measurements of parameters of stressedly-deformed states for reliable estimate of current performance data of durability resource of natural-technical systems and objective prognostication of **safe operation of critically important object of human environment**.

Instrumental soft hardware for efficient monitoring of power machines, mechanisms and constructions have been made and successfully tested. Information technology of technogenic safety makes it possible to considerably reduce losses from emergency situations, which may arise due to lack of operational discipline in industry and construction, decreases risks of terrorist actions, exceeds by several parameters the world science and technological level.

Innovation is very actual in the most important branches of economy: heat and nuclear energy, extraction and transportation of fuel, space and aviation, sea and ground transport, industrial, civil and military construction, all kinds of general and heavy machine-building, transport natural-technical systems and earthquake objects, geodynamic, hydroacoustic and bioenergenic systems, geological survey, risk insurance of emergency situations, construction nanomaterials science.

PURPOSES OF THE PROJECT

= technical and instrumental control, monitoring of state of infrastructure objects and natural-technical systems;

= ecological and technological monitoring of potentially dangerous objects in machine-building, energy, hydroacoustics, construction and other areas.

The project is presented by International Academy of Engineering (IAE) in cooperation with Taiwan Chapter of IAE.

台俄合作
計劃專欄

特別報導

COLLABORATION

資料來源：俄羅斯科學院

Over twenty years ago, the first delegation from the Siberian Branch of the Russian Academy of Sciences visited Taiwan and participated in the conference on air-space researches held by NCKU. This visit meant the start of cooperation between our researchers who now meet regularly in Taiwan and Siberia. Some Novosibirsk scientists were invited for a long period as visiting professors or for the post-doctorate program, students of Novosibirsk universities participated in under-graduate, master, and post-graduate programs. The official collaboration however started upon signing the Memorandum between SB RAS and NSC which stipulated joint researches on various topics, symposia in Siberia and Taiwan, exchange of visits and other events.

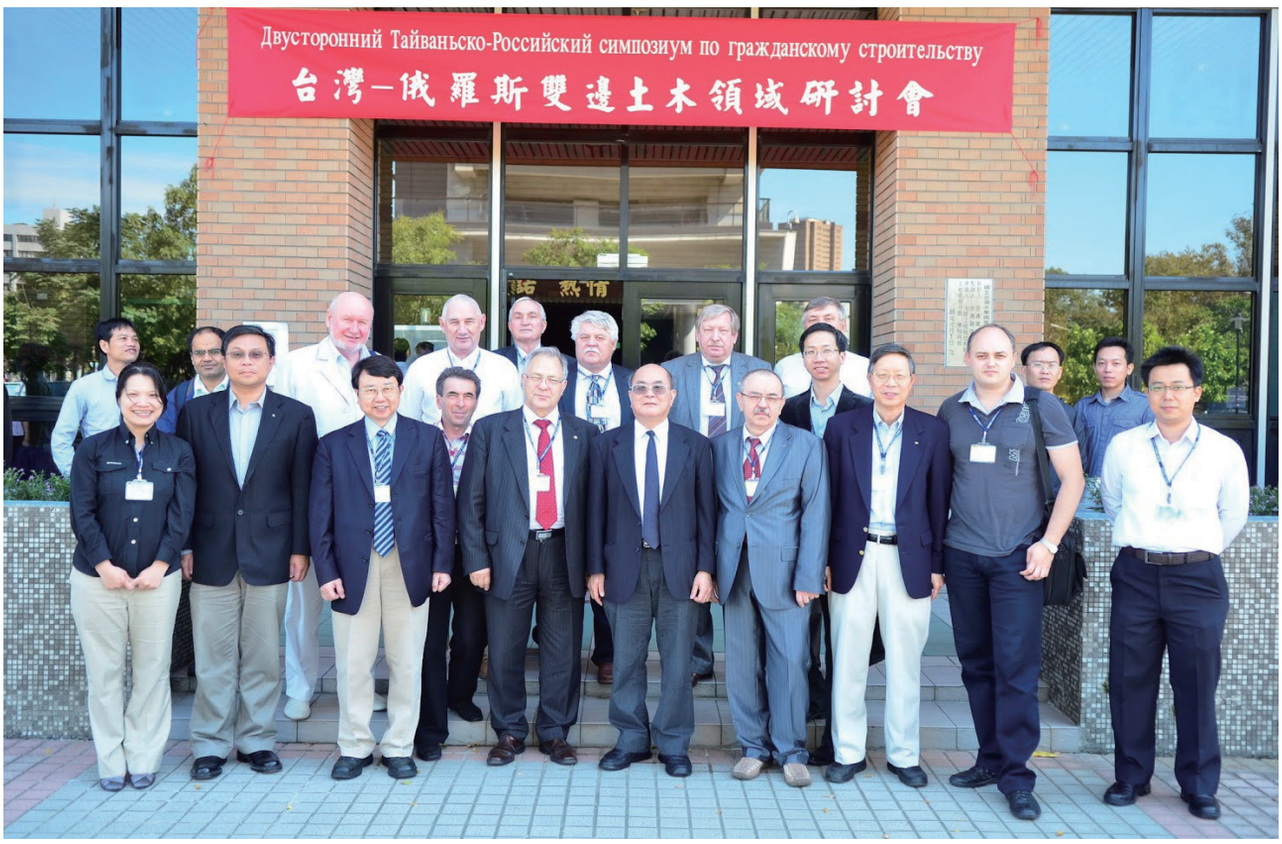
Every yearcompetition is held in various fields such as semiconductor physics, geology, biophysics, air-space investigations, material sciences, etc.

台俄雙邊土木領域研討會　　2012/11/03 攝於國家地震中心

The new trend occurred in the collaboration line after the meeting with Prof. Yen-Liang Samuel Yin and delegation led by Academician Vasily Fomin in 2010 in Taipei. Academician Fomin was interested in the problems of concrete reinforcement and its application in seismic-resistant construction. Great attention is focused on these issues in ITAM SB RAS and Geophysical Service SB RAS. In 2012, there was a symposium in Taiwan ("Innovative Technologies for Seismic Applications in Civil Engineering") performed within the framework of the collaboration between SB RAS and NSC; the chairmen were Director of NCREE Prof. Kuo-Chun Chang and Academician V. Fomin.

Not only Taiwanese experts on seismology, construction took part in the symposium, but also researchers dealing with associate issues such as material strength, material sciences, mathematical simulation, nanotechnologies, measuring systems; among them there were Samuel Yin, C.C. Chou (NTU), S.J. Huang (NTUST), K.N. Chiang (NCHC), Y.R. Jeng (NCYU), K.L. Wen (NCU), and many others. The Russian side was represented by the researchers from several institutes of SB RAS: V. S. Seleznev (GS), Yu. V. Chuguy (Technological Design Institute of Scientific Instrument Engineering), A.F. Emanov (Altaj-Sajan Branch GS), V.V. Moskvichev (Special Design and Technological Office "Nauka", Krasnoyarsk Scientific Center), A.V. Fedorov, E.I. Kraus (ITAM SB RAS) and others.

It was noted that there were many issues of common interest when the results could complement each other, and experimental findings of each side could be commonly utilized in calculation activities. Combination of the achievements of Taiwan seismologists and large developments of specialists from SB RAS can play important role in the development of seismological monitoring technologies; among them, above all, are the standing-wave analysis in engineering seismology, and vibration seismological investigations with powerful sources created in SB RAS.



台俄雙邊土木領域研討會報告者合影　　2012/11/03 攝於國家地震中心

In July, 2012, the delegation led by Prof. K.C. Chang, Director of NCREE, visited some institutes of the Novosibirsk Scientific Center. In ITAM SB RAS, the Taiwan visitors got acquainted with the works on mathematical simulation of the deformation and breakage of various materials.

The leaders of the Geophysical Service SB RAS organized a tour to a special field near Akademgorodok, on the shore the Ob' reservoir. This vibroseis field was created in 1979 to test the non-explosive driven sources of seismic waves – powerful vibrators are designed to study the Earth's crust and mantle, experimental studies on a number of fundamental problems in geophysics, such as the investigation of the stress-strain state of the geological environment, development and testing of new methods for detecting precursors of dangerous seismic events, the study of nonlinear interaction of geophysical fields and different nature etc. The visitors observed the performance of powerful earthquake simulators and saw the obtained results of fundamental researches.

All these meetings in Siberia and Taiwan, opinion exchange, discussions and negotiations resulted in the agreement for common researches on innovative calculation concepts and design of reinforced structures, sublimation of concrete behavior under different loadings, performed in ITAM under the supervision of Prof. Yu. Nemirovsky. The contract was concluded between ITAM and NCREE; the purpose of the contract was the creation of new models of reinforced framing deformation and breakage-concrete structures as thermodynamically non-equilibrium heterogeneous nonuniform and anisotropic systems in order to predict their behavior due to the variation in the internal structures of discrete and continuous reinforcement. It is suggested that the methods of prediction of deformation material properties be developed as geometrical and phase characteristics of the structural elements are changed; the target is to find the optimal and reasonable reinforcement structures which would provide maximal characteristics of reinforced products from the viewpoint of strength, rigidity, and performance reliability with the maximum achievable saving of consumables.

The first stage of this cooperation project is to be over soon.

In 2013, the bid was opened for the program of SB RAS and NSC; in included such topics as the Earth Sciences, Geology and Geophysics for Civil Construction. The joint project proposed by the Geophysical Service SB RAS (PI Prof. A. Emanov) and NCREE (PI Prof. K.C. Chang) entitled as "Experimental and theoretical methods for the study of seismic stability of high-rise buildings and monitoring technologies" succeeded in this bid.

Cooperation between Siberian and Taiwan scientists already gained recognition. In November, 2013, the First International Forum on Technological Development "TECHNOPROM – 2013" took place in Novosibirsk.

As noted by the Forum chairman, Deputy Prime Minister of the Russian Federation Dmitry Rogozin: "One of the key challenges for the Russian Federation in the XXI century is to achieve a technological breakthrough. This task requires to create the effective mechanism for cooperation between the representatives of modern high-tech business, development institutions, state authorities, Russian and foreign investors.

In this respect, the International Forum on Technological Development "TECHNOPROM–2013" assumes special significance. The Forum will become an important platform for promotion of the scientific achievements and the technological developments.

Novosibirsk region is the traditional scientific and innovative center, which has the significant potential for technological breakthrough and creation of the necessary conditions for further development and prosperity of the region".

The delegation of Taiwan Chapter of International Academy of Engineering was invited to take part in TECHNOPROM-2013.

One round-table meeting was devoted to innovative materials. Mr. Raymond Wan made a presentation of spiral concrete reinforcement.

We believe that the cooperation between the Siberian Branch of Russian Academy of Sciences and Taiwan Chapter of International Academy of Engineering will give practical results which will be used in both our countries.

俄羅斯科學院西伯利亞分院率團拜會中研院翁啟惠院長　　2011/11/10 攝於中研院

活動特輯 1

2013. 4. 22 ~ 4. 26
俄羅斯工程院 Gusev 院長訪台紀要

撰文 / 黃怡瑛

俄羅斯國際工程院（以下簡稱工程院）為廣納各國優秀人才投入創作活動，定期每一至兩年舉行院士選舉，本會隸屬工程院在台灣的分支機構，因此，獲得授權推薦台灣優秀工程人士參加遴選，有鑑於此，在理事會建議下，本會於2001 年成立推薦委員會，專職負責此重要任務。

2013 年 2 月 15 日工程院在莫斯科舉行會員大會，針對各分院推薦的名單進行院士及通訊院士投票選舉，台灣共七位優秀傑出人士獲選，計三名院士及四名通訊院士，詳細名單及專長領域如下表：

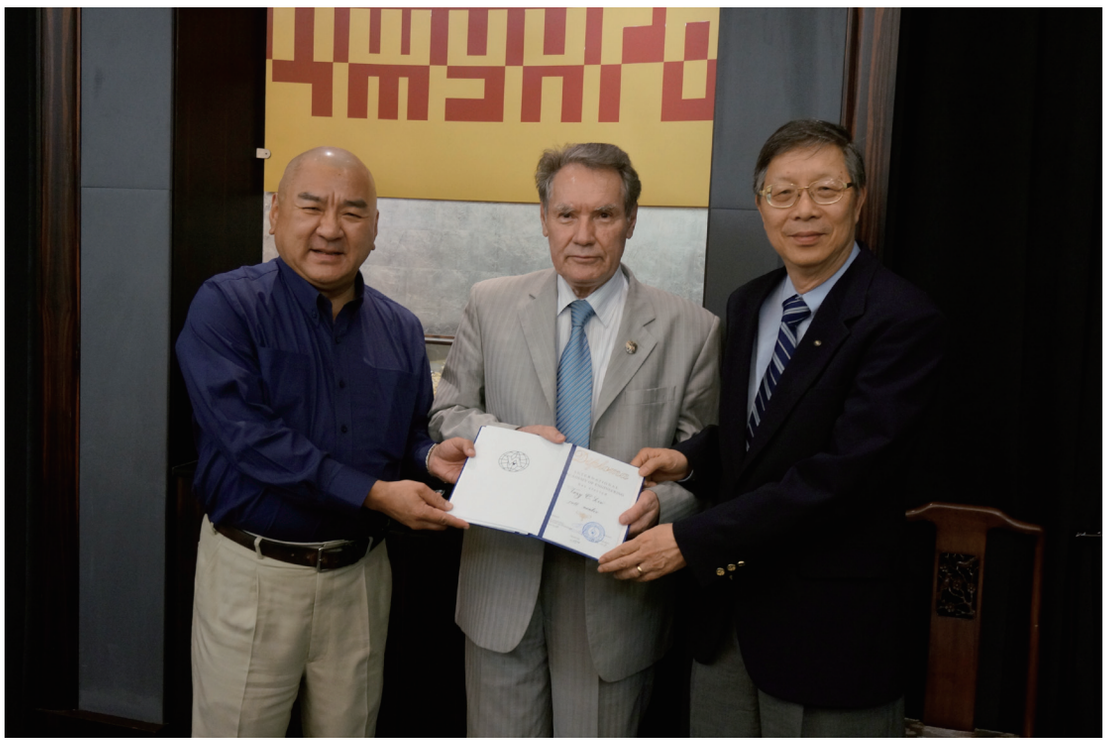
姓名	職稱	院士類別	領域
陳力俊	國立清華大學校長	院士	材料學與技術
劉楨業	中央研究院資深研究員	院士	材料學與技術
李建中	台灣世曦工程顧問公司董事長	院士	土木工程
曹壽民	中興工程顧問公司董事長	通訊院士	交通運輸系統
張桂祥	國家太空中心主任	通訊院士	航太
蔡克銓	國立台灣大學土木系教授	通訊院士	土木工程
江國寧	國立清華大學動力機械工程學系教授	通訊院士	工程力學

有鑑於台灣分會長期以來一直秉持總院宗旨積極從事台俄交流工作，因此，工程院古塞夫院長 B. V. Gusev 為了表示對台灣分會的肯定，專程於百忙之中抽空來台，4 月 22~26 在台期間，除親自頒發證書給新科院士並道賀外，也與分會成員討論未來合作發展項目及年度工作計畫。

在頒獎進行席間，院長也代表總院主席團頒發給中研院翁啟惠院長工程榮譽勳章，以表彰其在科學研究的重要研究成果及對學術和人類的貢獻。

翁啟惠院長獲頒工程榮譽勳章　　攝於 2013/4/24

陳力俊校長獲頒院士證書　　攝於 2013/4/24

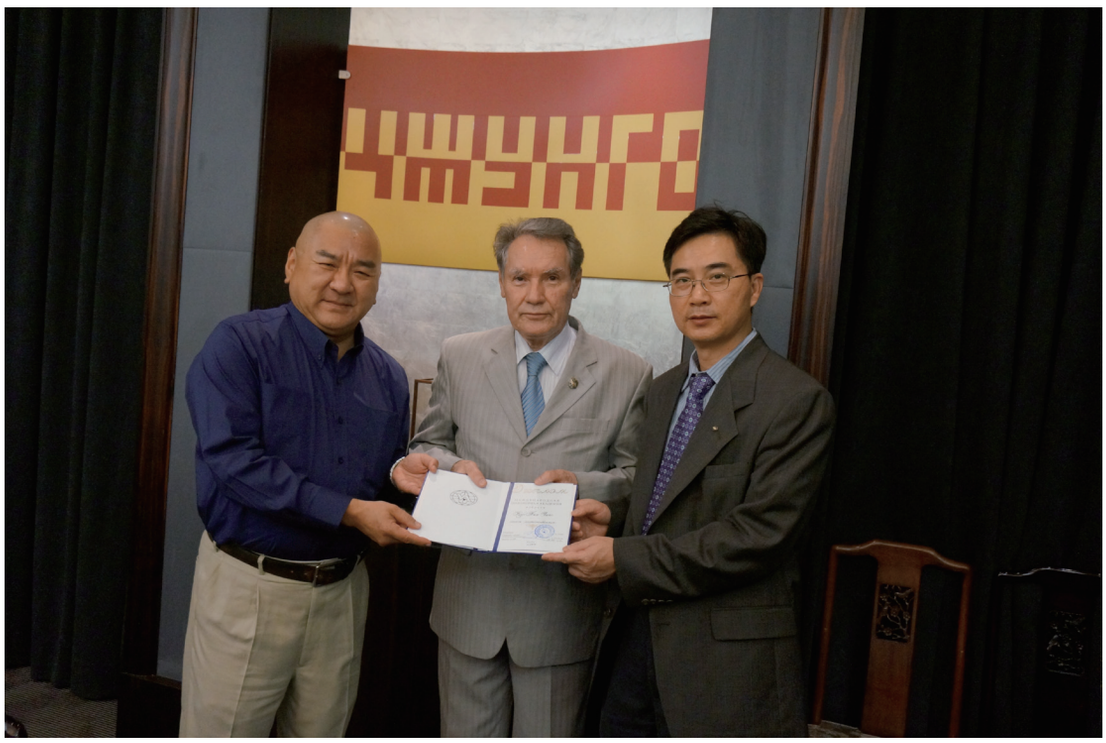


劉楨業博士獲頒院士證書　　攝於 2013/4/24

李建中董事長獲頒院士證書　　攝於 2013/4/25

曹壽民董事長獲頒通訊院士證書　　攝於 2013/4/24

張桂祥主任獲頒通訊院士證書　　攝於 2013/4/24



江國寧主任獲頒通訊院士證書　　攝於 2013/4/24

院長來台行程紀要如下：

2013.4.22 抵台，安排院長入住飯店並稍作休息，下午參觀故宮博物院

2013.4.23 花蓮太魯閣知性之旅

院長自本會成立以來，有多次訪台經驗，然而，始終未曾到過台灣東部，因此，趁這次機會安排院長到花蓮旅遊，參觀最有名的太魯閣國家公園。由於院長來台行程緊湊，因此，只允許有一天的時間可以參觀，而無法進行深度之旅，因此，當天安排院長參觀一些精華景點，例如：遊客中心、太魯閣牌樓、長春祠、布洛灣、天祥等，峽谷、燕子口等，沿途也欣賞印地安人頭石、慈母橋旁的青蛙石，院長對大自然的鬼符神工不禁嘖嘖稱奇，聽著流水聲，感受立霧溪切割峽谷的巨大力量。用過原住民式的午餐，下午到七星潭參觀，這是一處新月型的礫石海灣，湛藍的海景、賞景步道、觀日月樓，當天正好碰巧遇上空軍訓練機執行完任務返回基地的壯觀場面。

2013.4.24 ~ 25（三、四）

院長早上到國家地震中心與分會成員碰面，討論未來發展合作方向，與會者有：

張國鎮主任、曾惠斌老師、張大鵬教授等，雙方針對台俄近期內可發展的合作項目充分交換意見，席間院長亦預告 2014 年即將舉辦的混凝土國際研討會，由於台灣位居多地震帶地區，對地震相關的建築、結構等研究著墨甚深，因此，希望台灣學者能積極加入此研討會的行列，張主任表示，台灣分會成員將廣為宣傳並以實際行動支持此研討會，參加人數預計可達 10-15 人左右。另外，院長亦拜訪唐獎基金會並跟劉楨業老師碰面，由於自己曾擔任許多俄羅斯國家獎或政府獎的評選或籌辦角色，很清楚基金會工作的困難度及複雜性，席間除了勉勵承辦者的辛勞外，也對於尹總裁成立基金會及唐獎的美意給予高度肯定，院長堅信基金會一定可以為世界帶來相當程度的貢獻。

由於此行主要任務為頒發證書，並和台灣分會成員們討論年度台俄交流計畫，因此無法久留，院長的訪台之行，即在隔天一早搭機離台後劃下句點。

活動特輯 2

2013. 11. 12 ~ 11. 16
俄羅斯國際工程院台灣分會訪俄紀要

撰文 / 黃怡瑛

本代表團（陳振川、張慕聖、王瑞禎、黃怡瑛）應邀參加西伯利亞省政府與俄羅斯科學院合辦的科技工業展覽暨國際研討會活動，發表「多螺箍於台灣建築及橋墩的發展與應用」，增進俄羅斯科學界及工業界對多螺箍的認識與了解。

俄羅斯總統普丁目前針對科學院進行全面性組織改造，院內瀰漫對所有事務的不確定性，包括未來台俄計畫是否可以順利再進行，科學院友人也無法給予保證，但可以確定的是，台俄雙邊已經核定的計畫會持續進行，不會因組織改造而有變故。

在本會協助下，俄羅斯科學院西伯利亞分院與國震中心之合作研究案已獲得雙方政府補助，期程三年，台灣每年約補助 2~3 萬美元，可用於雙邊交流工作。明年國家地震中心研究人員預計前往西伯利亞針對研究案進行討論及交流。

陳振川老師與張慕聖院士與俄方交流愉快，陳老師在科學院報告 88 風災重建工程；張院士與俄科學院在結構診斷及理論分析方面有諸多交集，雙方將積極發展合作關係。

活動特輯 3

2014. 3. 24 ~ 3. 29
俄羅斯工程院 Gusev 院長訪台紀要

撰文 / 黃怡瑛

俄羅斯工程院院長 B. V. Gusev 於 3 月 24 日至 29 日期間訪台，行程活動包括：拜訪國家地震中心、台北科技大學、唐獎基金會、國家實驗研究院，並接受中央社及中央廣播電台的訪問，暢談台俄近年來在工程及學術領域的交流狀況。

2014 年 3 月 25 日古塞夫院長拜訪唐獎基金會，並與陳執行長暢談唐獎，對於這項備受國際關注焦點的大獎，給予高度肯定，尤其永續工程領域，更是人類未來的百年大計，強調人類應與大自然和平共存，如此才能彼此循環，生生不息。

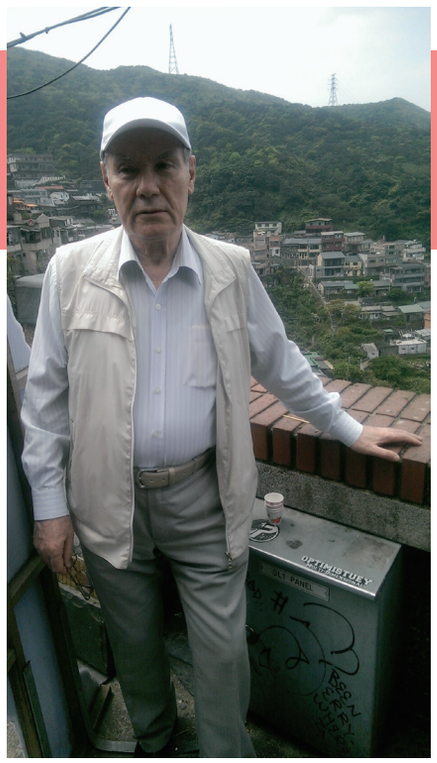
古塞夫院長與唐獎基金會陳振川執行長合影　2014/3/25 攝於唐獎基金會

古塞夫院長接受中央廣播電台俄語組主持人瑪莎的訪問
2014/3/27 攝於中央廣播電台

2014 年 3 月 27 日古塞夫院長代表國際工程院拜訪台北科技大學，北科大姚立德校長率領各學院代表及國際事務處人員向院長介紹學校概況、教學特色等。姚校長強調學生實務及理論的結合，這樣的教學概念相當獲得古塞夫院長的認同。院長也向北科大介紹工程院概況以及近期來正在從事的研究計畫：包括奈米瓷薄膜淨濾水裝置、生物廢料氣體反應爐、波動測量系統及風力發電系統等，並相當歡迎台灣的學校及產業一同參與研發及生產，院長亦歡迎北科大組團赴俄參訪，並承諾安排拜訪國立工業型大學：如莫斯科土木大學、門德烈夫化工大學、通訊大學、聖彼得堡工業大學等與會，姚校長表示期望可在今年九月進行訪俄交流活動。

古塞夫院長與北科大姚立德校長合影
2014/3/27 攝於北科大

2014/3/25 攝於宜蘭金車酒廠



2014/3/26 攝於九份

2014/3/26 攝於九份

2014/3/26 攝於黃金博物館

活動特輯 4

2014. 5. 11 ~ 5. 21
台俄土木工程學術交流活動

撰文 / 陳俊仲

2014 年 5 月 12 日至 16 日俄羅斯科學院於莫斯科總部舉辦第三屆全俄羅斯暨國際混凝土研討會議，主辦及協辦單位除俄羅斯工程院外，尚有俄羅斯科學院、俄羅斯教育及科學部、工商總會、俄羅斯建築及建設科學院、俄羅斯建築工程師協會、建築師聯盟、莫斯科國立土木大學、混凝土協會，以及國際組織 FIB、RILEM、ACI 等。主辦單位收到超過 53 個國家、俄羅斯 35 個地區共計 460 多篇文章，審查後出版約 300 餘篇，與會的專家、學者總計超過 1000 名。透過俄羅斯國際工程院台灣分會之協助，由俄羅斯國際工程院台灣分會理事長張國鎮教授為召集人，除國震中心台俄國合計畫成員外，並邀集台灣大學、台灣科技大學、台北科技大學、交通大學及潤弘精密工程等專家及研究學者共計 14 人，組成台灣代表團赴俄羅斯進行台俄學術交流活動，名單如下：

No.	姓名	職稱
1	張國鎮	國家地震中心主任 / 台大土木系教授
2	陳振川	唐獎基金會執行長 / 台大土木系教授
3	劉楨業	中研院資深研究員 / 台大土木系教授
4	曾惠斌	國立台灣大學土木工程學系教授
5	張大鵬	國立台灣科技大學營建工程系教授
6	周南山	國立台灣大學土木工程學系兼任教授
7	宋裕祺	國立台北科技大學土木工程學系教授 國家地震中心橋梁組組長
8	王瑞禎	潤弘精密工程研發協理
9	黃怡瑛	潤弘精密工程專案經理
10	劉光晏	國家地震中心副研究員
11	陳俊仲	國家地震中心副研究員
12	王仁佐	國家地震中心副研究員
13	許丁友	國家地震中心副研究員
14	林子剛	國立交通大學土木系助理教授

台灣代表團團員合影

代表團行程

日期		行程
5/11 (日)		抵達莫斯科
5/12 (一)		研討會開幕大會
5/13 (二)		研討會第二天 (分組報告)
5/14 (三)	上午	研討會第三天 (分組報告)
	下午	參訪俄羅斯工程院
5/15 (四)		參訪莫斯科國立土木大學 參訪莫斯科國立門德烈夫化工大學
5/16 (五)		工程暨文化導覽行程
5/17 (六)		部分團員搭機返台 / 台俄計畫成員前往新西伯利亞
5/18 (日)		抵達新西伯利亞
5/19 (一)		俄羅斯科學院西伯利亞分院 (台俄計畫工作會議)
5/20 (二)		台俄計畫工作會議 (現地地震監測站觀摩)
5/21(三)		搭機返台

2014 年 5 月 12 日至 14 日

出席第三屆全俄羅斯暨國際混凝土研討會議，本次代表團於大會共計發表了12篇研究論文，論文議題主要為混凝土在臺灣進行中之研究發展成果，包含了混凝土創新式預鑄工法、混凝土材料相關試驗及分析研究、混凝土結構之健康監測診斷與評估方法等，臺灣代表團的研發簡報在研討會中獲得高度評價，俄羅斯工程院院長古塞夫院長表示讚賞之外，會後也有俄方期刊編輯接洽進行邀稿事宜，下表列出本次代表團發表之論文標題及作者群。

第 1 篇 Authors Presenter:	Innovative Construction Technologies for Sustainable Development Samuel Yen-Liang Yin Jui-Chen Wang
第 2 篇 Authors Presenter:	Research and Application on Phase Change Materials in Energy Saving and Sustainable Building Hong-Bin Yang, Jenn-Chuan Chern, Dr. Tony C. Liu Dr. Tony C. Liu
第 3 篇 Authors Presenter:	Recent Research on Reinforced Concrete Structures at NCREE Kuo-Chun Chang Dr. Kuo-Chun Chang
第 4 篇 Authors Presenter:	A New Pushover Process of Reinforced Concrete Frames with Possible Shear Failure at Beam-column Joints Yu-Chi Sung, Tzu-Kang Lin*, C.C. Hsiao and Ming-Chun Lai Dr. Tzu-Kang Lin
第 5 篇 Authors Presenter:	Evaluating Structural Performance of Deteriorated Reinforced Concrete Bridges by Using Reliability-based Methods Yu-Chi Sung*, Chun-Chung Chen, Hsiao-Hui Hung, Ming-Chun Lai, Chia-Chuan Hsu Yu-Chi Sung
第 6 篇 Authors Presenter:	Numerical Simulation of Reinforced Concrete Structure using Vector Form Intrinsic Finite Element Ren-Zuo Wang*, Kuo-Chun Chang, Chung-Yue Wang, Bing-Chang Lin Dr. Ren-Zuo Wang

張國鎮主任、劉槓業教授、陳振川教授受邀上台參加開幕儀式
2014/05/12 攝於俄羅斯科學院行政大樓

第 7 篇 Authors Presenter:	Health Monitoring of Reinforced Concrete Structures Using Smart Aggregates Wen-I Liao, C. H. Lin, J. S. Hwang, G. Song, Ting-Yu Hsu, Chun-Chung Chen Dr. Chun-Chung Chen
第 8 篇 Authors Presenter:	Seismic Performance Assessment of New RC Bridge Column Kuang-Yen Liu Kuang-Yen Liu
第 9 篇 Authors Presenter:	Development and Testing of Integrated Bridge Disaster Prevention Hui Ping Tserng , Shen Haw Ju Prof. Hui-Ping Tserng
第 10 篇 Authors Presenter:	Permeable Concrete Pavement with Multiple Functions -- An Innovative Green Technology Developed in Taiwan Nelson N. S. Chou, Jui-Wen Chen, Chung-Ming Liu Nelson N. S. Chou
第 11 篇 Authors Presenter:	SEISMIC PERFORMANCE OF NEWRC HOLLOW-SECTION BRIDGE COLUMN Kuang-Yen Liu Kuang-Yen Liu
第 12 篇 Authors Presenter:	Eco-binder utilizing Slag and CFBC fly ash Nguyen Tien Dung , Ta-Peng Chang Prof. Ta-Peng Chang

本次本中心及俄羅斯國際工程院臺灣分會特別在會場設置宣傳攤位，就單位組織之性質及涉及的相關研究議題進行宣傳，向國際表現臺灣學術研究及業界應用能力，展示攤位於會議期間吸引了許多參觀者，和代表團成員交流熱絡，均期待未來有機會可以進行實質合作活動。

代表團出席研討會議活動照片

2014 年 5 月 15 日

透過俄羅斯工程院協調聯絡與安排，代表團前往莫斯科門德烈夫化工大學 (D. Mendeleev University of Chemical Technology of Russia, MUCTR) 及莫斯科土木大學 (Moscow State University of Civil Engineering, MSUCE) 進行參訪交流。

代表團參訪門德烈夫化工大學活動照片

代表團參訪莫斯科土木大學活動照片

2014 年 5 月 16 日

由俄羅斯工程院安排代表團進行工程暨文化導覽行程，代表團實際搭乘莫斯科地鐵，體驗莫斯科市地鐵系統及裝飾華麗的地鐵車站，同時藉機會參觀了俄羅斯著名的景點包括紅場、聖瓦西里大教堂、克里姆林宮。

莫斯科市城市導覽活動照片

2014 年 5 月 17 日

部分代表團成員結束本次出國行程搭機返台，台俄研究合作計畫成員則搭機前往新西伯利亞市。針對研究合作計畫工作進行細部工作規畫與討論，會中研究團隊成員均個別就計畫執行內容進行工作簡報，雙邊討論熱絡並達成具體合作交流內容，包括文獻資料分享及合作實驗資料庫規劃等，對於未來為期三年之合作研究建構實質交流項目，同時期待持續之交流活動。俄方並安排台方研究成員參訪該分院所屬地質調查研究所之地震觀測站，強化雙邊研究與試驗技術合作之交流平台。

2014 年 5 月 18 日

台俄計畫研究成員抵達新西伯利亞市拜訪俄羅斯科學院新西伯利亞分院，國震中心與俄方研究團隊研提雙邊共同合作研究計畫內容，將針對高樓建築結構耐震穩定性問題，進行實驗與理論分析方法和相關監測技術的研究。

2014 年 5 月 19 日至 20 日

雙邊研究人員進行計畫工作會議，就合作議題進行交流及資料討論，會中討論相當熱絡並已達成具體合作交流內容，包括文獻資料分享及合作實驗資料庫規劃等，對於未來為期三年之合作研究建構了實質交流項目，同時期待雙邊研擬更廣泛並保持交流活動。

2014 年 5 月 21 日

計畫成員結束本次出國行程返台。本次台灣代表團參訪行程，特別感謝俄羅斯國際工程院台灣分會之協助，包括口譯人員及參訪行程的協調規劃，讓代表團成員得以順利達成任務，相信分會在未來台俄之間相關的交流活動仍將持續扮演關鍵的角色。

台俄計畫工作會議活動照片

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