1. Bibliography

Professor YANG Wei was born on February 16, 1954, in Beijing, China. He completed his undergraduate study at Northwestern Polytechnic University in December 1976, received his MS degree from Department of Engineering Mechanics, Tsinghua University in April 1981, and Ph.D. degree from Division of Engineering, Brown University, USA, in June 1985. He was promoted to the rank of full professor in December 1989, as the youngest professor in Tsinghua University then.

In December 1993, Professor Yang was appointed as the Director of the Failure Mechanics Laboratory of the Ministry of Education in China. He served as the Department Head of Engineering Mechanics from 1997 to 2004, and the Executive Dean of Aerospace School from May to September of 2004 at Tsinghua University. From 1999 to 2004, he was endowed as a Yangtze Professor of the Chinese Ministry of Education. He chaired the Academic Committee of Tsinghua University from April 2004 to August 2006. From September 2004 to July 2006, he served as the Director-General of the Academic Degrees Committee of State Council of China, and also as the Head of Directorate of Graduate Education in the Ministry of Education in China. From August 2006 to February 2013, he took the position of the President of Zhejiang University. Since February 2013, he has been appointed as the President of the National Natural Science Foundation of China (NSFC).

2. Academies

Professor Yang was elected as a member of the Chinese Academy of Sciences (CAS) in 2003. He served as the Head of the Technological Science Division of CAS from 2008 to 2012. Professor Yang became a member of TWAS in 2004.

3. Visiting Professorship

Prof. Yang has been invited to be guest professors and scientists in many leading universities in USA, UK, France, Japan, China Hong Kong and China Taiwan.

4. Awards

Professor Yang's honors and awards include the "May Fourth Youth Medal" from Beijing Municipal Government and the Chinese Youth Award of Science and Technology in 1988, the State Council Special Government Allowance in 1992, the National Excellent Teacher Award in 1993 as one of the 10 best teachers nominated by Beijing Municipal Government, the Chinese Young Scientists Award and the title of "National Young and Mid-aged Experts with Outstanding Contributions" in 1994, and the National Mayday Medal in 2002. His achievement "Macroscopic and

Mesoscopic Constitutive Theory and Fracture of Solids" enabled him to win the 3rd-Class National Natural Science Award in China (1995) and "Mechatronic failure and Constitutive Relations of Ferroelectric Ceramics" won him the 2nd-class National Natural Science Award (2005), both as the first winner. He was the recipient of the 2008 Award for Mathematics and Mechanics by Ho Leung Ho Lee Foundation, and the Zhou Peiyuan Award for Mechanics in 2011. He received an Honorary Degree of Doctor of Engineering in 2011 by Hong Kong Polytechnic University, and an Honorary Degree of Doctor of Science in 2012 by Brown University, and an Honorary Degree of Doctor of Law in 2013 by Bristol University..

5. Academic Services

Professor Yang's current academic services in China include the Executive Committee Member of China Association of Science and Technology, Convener of the Mechanics Discipline-appraising Group of the Academic Degrees Committee, and is served as the President of Chinese Society of Theoretical and Applied Mechanics. Currently, he chairs the committee for the National Natural Science Award. Internationally, Professor Yang is one of the eight Bureau Members of International Union of Theoretical and Applied Mechanics (IUTAM) and served as the Chairman of Far East and Oceanic Fracture Society (2004-2008).

6. Education Services

As an educator, Professor Yang has been elected in several key positions in various organizations of higher learning institutions. He served as the Chair of the Association of Pacific Rim Universities (APRU) in 2009/2010. He is the Chairman of the Union of Research Universities in China (including 9 leading research universities in the mainland and 3 leading research universities in Hong Kong) in 2008-2010. He is also the Asia-Pacific Chair of Global University Network of innovation (GUNi). He is the Chair for C9 (9 leading universities in China) in 2008 and 2012. He was elected to the administrative board of International Association of Universities (IAU). He also serves as a member of the International Advisory Panel for Higher Education in Singapore. He led Zhejiang University to fight research misconduct, and was highly praised by international academic community (see the New Feature Article "Zero Tolerance – A University Crackdowns the Misconduct in China", Nature, Jan. 12, 2012). He also wrote an Editorial for Science in 2013, entitled "Research Integrity in China".

7. International Activities in Engineering

Professor Yang was elected by its members in 2008 as the head of the Technological Science Division of Chinese Academy of Sciences. He also served as the Chair of Engineering Science Division of TWAS from 2010 to 2013. Both jobs aim at the promotion and development of engineering in China and the Developing Countries.

Professor Yang serves in various international journals in engineering. He is one of the four regional editors of Composite Science and Technology, the international journal with the highest IF in the field of composite materials. He serves in the

editorial boards of Int. J Fracture，Fatigue & Fract. Eng. Mats. & Structs.，J. Mech. Phys. Solids, Modeling Simulation of Material Science and Engineering and Archives of Applied Mechanics.

As a professor, Yang has educated more than 40 postgraduate students, with more than half of them pursuing academic careers in the field of engineering. More than ten of his students have become engineering faculties in United States and Europe.

Professor Yang received several awards for his effort to promote engineering in international level. In 2009, he received Brown Engineering Medal; he received the Eric Reissner Medal by International Society of Engineering Science in 2011, and the Calvin Rice Lecture Award by American Society of Mechanical Engineers in 2012.

8. Publications

Professor Yang has made important contributions in the fields of Fracture Mechanics, Mechatronic Reliability, and Micro/Nanomechanics. He has authored and co-authored 11 books and 260 technical papers in internationally refereed journals. His works have been cited more than 3000 times by journals in SCI and He has an H-index of 30.

Academic Contributions of Prof. Yang Wei

I. Fracture Mechanics：

Yang and Freund (1981) proposed a quasi three-dimension theory for the elastic crack-tip fields that led to the conclusion that the zone size of three-dimensional effect is less than a half of the plate thickness. This prediction was verified by Rosakis from Caltech and Ravichandar from University of Houston through caustic measurements. It was also confirmed by the large-scale finite elements computation in MIT. That proposition thus becomes a criterion for the validity of optical measurement of the crack tip fields.

Yang and co-workers (1991) resolved the crack-tip singularity fields for dynamic and transonic debonding, and proved that only limited energy is required for dynamic debonding at the lower Rayleigh wave speed, thus challenging an earlier claim that the speed of the crack extension may never exceed the Rayleigh wave speed. This finding accelerated the emergence of the intersonic fracture mechanics. Based upon the simplification of the theoretical fracture resistance curve for power hardening materials，Yang (1987) proposed the J-T two parameters elastic-plastic method to assess defects in the ductile tearing process. The methodology has been adopted as a candidate scheme for evaluating defects in nuclear power plants in China. This work won him, as the first recipient, the 2nd-class Award for Science and Technology Advancement from the State Education Commission in 1990.

The analysis of the kink band instability in laminated materials, which Professor Yang worked jointly with his student Yueguang Wei (1992), delineates the characteristics

and criteria of kink band instability of various types. The paper was carried in the inauguration issue of International Journal of Damage Mechanics, with the kink band instability patterns as its cover design. He received the 3rd-Class National Natural Science Award in China in 1995 for his contributions in “Macroscopic and Microscopic Constitutive Theory and Fracture of Solids”. He was invited to edit the 8th Volume (entitled “Interfacial and Nanoscale Failure”) of a major reference work “Comprehensive Structural Integrity” of Elsevier Science that was published in 2003 and won international book award.

Professor Yang worked jointly with his PhD student Honglai Tan (1994) to simulate, by atomistic/continuum overlapping method, the dynamic process of dislocation emission from a crack tip. The method is served as an earlier example for multi-scale simulation from continuum to mesoscopic and to atomistic scale. This achievement was presented in the annual report of the National Natural Science Foundation of China. His monograph “Macroscopic and Microscopic Fracture Mechanics” (1995), with the discussions of fracture mechanics from 3 mutually interacting scales, namely macroscopic, microscopic and nanoscopic scales，won him the first book prize set up by People’s Liberation Army of China in 1996, and his student Honglai Tan’s dissertation was recognized as one of the National Excellent PhD Dissertations.

II．Mechatronic Reliability

Professor Yang and his coworkers proposed a number of models for electric fracture, electric field induced fatigue cracking and toughening by domain-switch. These works laid down the foundation of mechatronic reliability. They proposed that the electrodes or the damage paths, due to the non-uniform electrostrictive strain field, might induce incompatible stress in ferroelectrics. That description led to the mechanics formulation of electric fracture. Two other papers that Yang co-authored with his PhD student Ting Zhu explained the switch-toughening model (JMPS, 1998) and electric field induced fatigue cracking by complicated domain orientation pattern (JMPS, 1999) have been frequently cited by SCI. Ting Zhu was awarded in 2001 as National Excellent PhD dissertation. Professor Yang’s researches in this area also include domain switch patterns and unconventional domain bands resulting from the concentrated electric field at the crack tip (with his colleague Fei Fang).

His monograph “Mechatronic Reliability” (2001), jointly published by Tsinghua University Press and Springer-Verlag, is a summery of his researches in the field. The English version has been distributed internationally, demonstrating his systematic works in electric fracture, mechatronic coupling, domain switching and mass-flow instability. The English version has been reprinted with the 2nd edition. In 2004, Professor Yang was appointed Chairman of the Science Committee to organize the academic symposium of IUTAM “Mechanics and Reliability of Actuating Materials”, and his works on “Mechatronic Failure and Constitutive Relations of Ferroelectric Ceramics” won him the 2005 2nd-class National Natural Science Award as the first recipient.

III. Micro/Nanomechanics:

As the first author, Professor Yang has written an English monograph “Mesoplasticity and Its Applications”, published by Springer-Verlag in 1993. The book explored the context of the mesoplasticity, a cutting-edge disciplinary branch. The book has been praised by Trzesowski from the Institute of Fundamental Research of Polish Academy of Science as “a comprehensive treatise of the subject” (IJTP, Vol. 36, Page 2877). In the preface written by Ilschner, Editor-in-Chief of the “Material Science and Engineering” series, these comments are found: “This monograph written by two Chinese scientists of the younger generation opens a window into the world of thoughts on Mechanical Metallurgy in this fascinating area of our world”，“Between structural defects in the micrometer scale and the meter-measures of engineering components, the term of mesoplasticity is meant to place the reader right in the center”. In 2000, Professor Yang worked collaboratively with others to measure crack tip displacement in nanoscopic range of single crystal Si and obtained for the first time the strain distribution in the region of 4nm to several hundred nanometers away from the crack tip. He has also made explorations in new areas of nanomechanics. In recent years, Professor Yang has done interesting works in theories of plasticity of nanocrystals (JMPS, 2004) and the numerical simulation of nanostructures, with papers published in high IF journals such as PRL (2007), NanoLetters (2007), and PNAS (2009). His expertise in this subject won him the position as the chairman of WP7 (Mechanics in Micro- and Nano-scales) of IUTAM. Recently, he and his group are working on the experimental and numerical simulation of nanocrystals and graphenes. A series of 5 papers are published in high impact journals, such as NanoLetters, Nanoscale and Scientific Reports.