Press Release
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Progress in Additive Manufacturing: From 2D Printing to 4D Printing of Structural Materials and Functional Devices

A world-renowned materials scientist, **Professor Jian Lu**, Vice-President (Research and Technology) of the City University of Hong Kong (CityU), delivered an online lecture titled “Progress in Additive Manufacturing: From 2D Printing to 4D Printing of Structural Materials and Functional Devices” for the **Hong Kong Institute for Advanced Study (HKIAS)** at CityU on 6 October 2020.

The additive manufacturing is evolving rapidly in numerous applications, such as biomedical implants, aerospace components, and structures. In this talk, Professor Jian Lu, a Senior Fellow at HKIAS and a Chair Professor of Mechanical Engineering at CityU, explored how to solve the problem of applying nanostructured ceramic materials with complex shapes in the field of additive manufacturing, including areas of 4D printing.

Recently, scientists are looking to the four-dimensional to create a new generation of printed smart materials capable of changing their shape. Professor Lu presented the new concepts of supra-nanostructured materials and nanostructured dual-phase (glass-nanocrystal) composites to tackle the challenges of 3D printing by ceramics.

Professor Lu explained 4D printing enables more complex shapes to be created than conventional 3D printing. In this direction, Professor Lu and his team developed the printed ceramic precursors with versatile shape-morphing properties that will radically change many industries. He explained that this technology could extend to other high melting temperature materials based on complex shape components. He highlighted the key advantage of 4D printing is objects can be reshaped or reassembled by mechanical force, temperature, or a magnetic field in the process.

Professor Lu believed that the additive manufacturing is a powerful tool for developing new designs due to its tailor-made solutions nature. In addition, he said that 4D printing has very inspiring and promising for the future. It can be applied in various industries, including space exploration and biomedical implants.

Over 250 online participants joined this virtual lecture and explored the latest development of additive manufacturing with Professor Lu. During the Q&A, several participants worldwide submitted questions for the speaker in real-time.

Professor Lu’s primary research interest is advanced nanomaterials and its integration in mechanical and biomedical systems using the combination of experimental mechanics and mechanical simulation. He has published more than 360 SCI journal papers in leading scientific journals. Professor Lu has been the receipt of numerous awards including the French Knight of the National Order of Merit and French Knight of the National Order of Légion d’Honneur in 2006 & 2017. He received the Guanghua Engineering Science and Technology Award from the Chinese National Academy of Engineering in 2018. Besides, he is a member of the National Academy of Technologies in France and a Fellow of the Hong Kong Academy of Engineering Sciences.

This lecture is supported in part by the Kwang Hua Educational Foundation.

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About Hong Kong Institute for Advanced Study (HKIAS)

The Hong Kong Institute for Advanced Study (HKIAS), which was launched on 22 November 2015, aspires to be an international centre of excellence for the advancement of technology and innovation by bringing together an interdisciplinary team of world-renowned scholars and researchers, including Nobel laureates and academicians, to contribute to the solutions of pressing real-world problems. Conferences, symposiums, workshops, and lectures will be organized to facilitate exchange of ideas among academic communities locally, regionally and internationally.

Photo Captioned:
Photo 1:
Professor Jian Lu delivered a lecture for the Hong Kong Institute for Advanced Study.

Photo 2:
Professor Way Kuo, the President of CityU discussed the development of the additive manufacturing with the speaker during the Q&A.

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