香港大學 機械工程系
Department of Mechanical Engineering
THE UNIVERSITY OF HONG KONG

SEMINAR

Title: Central Fabrication Laboratory- Technical sharing session –Research applications of magnetron sputtering technology and the cathode technical features

Date: 21 September 2026 (Monday)
Time: 2:30pm - 4:00pm
Venue: Room 7-35
Haking Wong Building, HKU

Speaker: Mr. Charlie HU
Kurt J. Lesker
Senior Manager of Asia PED Technical Sales / Technical Support / Service

Language: Mandarin

Limited seats available on a first-come first-served basis

Abstract:
The Central Fabrication Laboratory (CFL) is a cutting-edge cleanroom facility located at the University of Hong Kong. Its primary mission is to provide advanced fabrication facilities and expertise to enhance teaching and research activities in micro/nano fabrication. As a leading research laboratory, CFL offers open access not only to University of Hong Kong members but also to local and international institutions, researchers, and companies, with collaborations from the private sector always encouraged. The technical sharing sessions offered by CFL are designed to keep participants updated on the latest micro/nano fabrication techniques and provide valuable networking opportunities with experts from around the world.

Sputter deposition, commonly called sputtering, removes atoms or molecules from a solid target surface and projects them into the gas phase, where they condense on another surface. Unlike evaporation techniques, sputtering does not require melting the source material, rarely ejects large particles onto the substrate, and allows the source to be mounted in any orientation. It also transfers relatively little radiated heat to the substrate,

provides coverage that is not strictly line-of-sight, and can deposit elemental mixtures, alloys, and compounds with good stoichiometric control.

Many sputter-PVD coatings are compounds. These can be deposited by co-sputtering from multiple sources or by using compound targets. However, when the target and deposited film are electrically insulating, DC sputtering and substrate biasing are unsuitable, so RF sputtering is typically required. When sputtering compounds, achieving the desired stoichiometry can be difficult even with a stoichiometric target. The plasma may dissociate the compound, and volatile species such as nitrogen, oxygen, or hydrogen can be lost, producing sub-stoichiometric films.

Reactive sputtering addresses this issue by introducing a reactive gas, such as nitrogen, oxygen, hydrogen, or hydrocarbons, alongside the inert sputter gas. The reactive gas replenishes deficient elements by reacting with the sputtered flux or growing film, either directly or after activation by the plasma. By controlling the reactive gas partial pressure, the film stoichiometry can be tuned for the desired application.

Although flexible and widely used, this approach has drawbacks. RF sputtering generally has lower deposition rates than DC sputtering, and compound targets often have lower sputter yields than metallic targets. RF power is also more complex to implement and harder to scale to high powers.

An alternative is to sputter metallic or conductive targets using DC power while supplying selected elements entirely through reactive gases. This can increase deposition rates and allow wider control of film stoichiometry, including graded compositions from pure metal to compound. However, because the metallic target surface can also react with the gas, process control is usually more demanding.

Biography:

Mr. Charlie HU , Senior Manager of Asia PED Technical Sales / Technical Support / Service for Kurt J. Lesker.

Mr. Charlie HU has worked at Kurt J. Lesker for more than 16 years and has been in the thin film deposition system product sector for over 10 years. He is the product expert in Electron Beam evaporation, Thermal evaporation, Magnetron sputtering, ALD , specializing in both hardware and process tuning.

ALL INTERESTED ARE WELCOME

For further information, please contact Mr. YIP P.S. (3910 2637, psanyip@hku.hk) or Prof. Chan P.K.L. (3917 2634, pklc@hku.hk).