中国科学院数学与系统科学研究院
数学研究所
数学科学全国重点实验室

多复变与复几何研讨班

SCV&CG Seminar

Speaker: 李正浩 博士 **(韩国基础科学研究院)**

Inviter: 周向宇 院士

Language: Chinese

Title: Dirichlet forms for m-subharmonic functions

Time & Venue: 2026 年 11 月 14 日（星期六）

15:30 - 17:30 & 南楼 N913

Abstract:

On a bounded open subset of $\mathbb{C}^n$, we study the Dirichlet form induced by an admissible pair (θ, μ), where μ is a positive Radon measure and $\theta=dd^c u_1 \wedge \ldots \wedge dd^c u_{m-1} \wedge (dd^c|z|^2)^{n-m}$ for locally bounded m-subharmonic functions $u_1,\ldots,u_{m-1}$. We prove that locally bounded m-subharmonic functions belong locally to the domains of these Dirichlet forms and are quasi-continuous with respect to the induced capacities. We establish a monotonicity property for Dirichlet forms, which motivates the introduction of μ-quasi-monotone convergence of m-subharmonic functions. The natural embeddings into these domains are continuous with respect to this convergence. These results yield new proofs of the commutativity and continuity of complex Hessian operators.

Using this framework, we characterize quasi-continuity with respect to the induced capacity for an arbitrary m-subharmonic function in terms of its pole set having zero measure μ, or equivalently, zero induced capacity. On bounded strictly m-pseudoconvex domains, we prove that the Bedford--Taylor capacity for m-subharmonic functions and the capacities induced by the corresponding Dirichlet forms have the same null sets. We further characterize m-polar sets in terms of Dirichlet forms and stochastic processes, extending the corresponding characterization of pluripolar sets due to Fukushima and Okada to the m-subharmonic setting.

This is a joint work with Bowoo Kang (University of Cologne) and Jaechul Lee (KAIST).