Full Name (English):	（中英文）**Xiaomin Chen (陈晓敏)**	
Affiliated Institution and Title (English):	（中英文） **Associate Professor** **Nantong University** **南通大学 副教授**	

Biography
(Please provide in paragraph form within 500 words.) （中英文）

Xiaomin Chen is a full Professor in the Department of Communication Engineering, School of Information Science and Technology, Nantong University, China. Her research interests include energy-efficient optimization and reliability enhancement for wide-area IoT communications, near-shore maritime communications, broadband wireless communication systems, and integrated sensing and communication (ISAC) networks. She received her Dr.-Ing. degree (**Summa Cum Laude**) from Technische Universität Braunschweig, Germany, and previously worked as a Senior Engineer at Telefónica Germany, where she was involved in backbone network planning and strategic research. Prof. Chen has led multiple research projects funded by the National Natural Science Foundation of China as well as provincial and municipal agencies, and has carried out collaborative research with industry partners. She has published extensively in leading international journals and conferences in wireless communications, IoT, and maritime communication systems.

陈晓敏，南通大学信息科学技术学院副教授。主要研究方向包括广域物联网通信的能效优化与可靠性增强、近海通信、宽带无线通信以及通信与感知一体化网络。陈晓敏教授于德国布伦瑞克工业大学（Technische Universität Braunschweig）获得工学博士学位（Summa Cum Laude），曾在德国 Telefónica 担任高级工程师，从事主干通信网络规划与战略研究工作。她主持国家自然科学基金及省部级、市厅级科研项目多项，并与企业开展产学研合作研究，在无线通信、物联网及海上通信领域的国际期刊和会议上发表多篇学术论文。

Speech Title (English): （中英文）

Energy-Efficient Multi-Agent UAV-Assisted Maritime Communications
面向能效优化的多智能体无人机辅助海上通信技术

Speech Abstract
(Please provide in paragraph form within 500 words.) （中英文）

Reliable and continuous wireless connectivity has become increasingly important for maritime communications, driven by the rapid growth of intelligent shipping and offshore activities. Shore-based communication systems are constrained by limited coverage, while satellite communications, although capable of wide-area service, are often costly and inflexible. These limitations motivate the exploration of alternative solutions that can provide both coverage flexibility and cost efficiency. Unmanned aerial vehicles (UAVs), with their rapid deployment and adaptive coverage capabilities, offer a promising option for maritime communication scenarios, yet their practical deployment raises challenges related to energy efficiency, sparse vessel distributions, and the coupled design of coverage and trajectories.

This talk discusses an energy-efficient multi-agent UAV-assisted maritime communication framework that integrates predictive planning with cooperative control. By leveraging time-series forecasting, vessel distribution over future time horizons can be anticipated, enabling proactive UAV deployment and more informed resource allocation. To improve coverage efficiency in sparsely populated maritime environments, adaptive clustering is used to form virtual maritime cells. Building on this framework, multi-agent reinforcement learning is employed to coordinate UAV trajectories and propulsion power while satisfying communication performance requirements. The talk emphasizes the gained from combining prediction-driven planning with

multi-agent intelligence, and highlights how cooperative UAV systems can support more flexible and energy-efficient maritime communication networks.

随着智能航运和海上作业的快速发展，海上无线通信对连续性和可靠性的要求日益提高。岸基通信系统覆盖范围有限，而卫星通信虽然具备广域覆盖能力，却在成本和灵活性方面存在不足。这些现实需求促使人们探索更加灵活、高效的通信解决方案。具备快速部署和自适应覆盖能力的无人机平台，为海上通信提供了一种具有吸引力的选择，但其应用仍面临能效受限、船舶分布稀疏以及覆盖与轨迹耦合设计复杂等挑战。本报告围绕面向能效优化的多智能体无人机辅助海上通信展开，结合预测规划与协同控制思想。通过时间序列预测对未来船舶分布进行预判，实现无人机部署与资源配置的前瞻性调整；采用自适应聚类方法构建虚拟海上小区，以提升稀疏场景下的覆盖效率；并进一步探讨利用多智能体强化学习实现无人机轨迹与能耗的协同优化。报告重点分享该框架背后的设计理念与系统层面启示，展示多智能体无人机协同在提升海上通信灵活性与能效方面的潜力。