

2025 年度 核融合科学研究所 第 14 回 ITER 国際スクール参加支援  
実施報告書

IIS2025 参加支援			
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派遣期間	2025 年 6 月 28 日 ～ 2025 年 7 月 5 日 ( 8 日間)		
得られた成果等 (行数は適宜増やしてください)	<p>1. 本スクールでの印象に残った講義やイベント等</p> <p>One of the most impressive experiences I had during the school was the on-site visit to the inside of the ITER facility. Although the full Tokamak device has not yet been assembled, I was able to see several of the completed components as well as the massive buildings and critical infrastructure that support its future operation. Standing in front of such a gigantic and complex system in real life—something I had only seen in textbooks or slides before—was truly overwhelming. I got to see some of the most cutting-edge technologies in fusion, including parts of the superconducting magnets, the vacuum vessel, and the cooling systems. Witnessing their actual size and structure helped me realize just how challenging and sophisticated the engineering behind ITER really is. What made the experience even more valuable was the explanation from the staff involved in the ITER project. They provided a clear and accessible overview of how the system works and how international collaboration makes such an ambitious project possible. This visit not only deepened my understanding of fusion technology but also inspired me to think more globally about science and teamwork. It was truly a once-in-a-lifetime opportunity.</p> <p>2. 本スクールに参加して新たに得られた知見や技能等</p> <p>Through this ITER school, I gained a wide range of new knowledge and technical understanding related to Tokamak-type fusion reactors. I learned about the assembly process of the Tokamak device, the mechanisms for controlling plasma density and temperature, and the structure and function of the Outer Scrape-Off Layer (OSL).</p> <p>In a Tokamak, the OSL refers to the transitional region located just outside the confined plasma. It acts as a critical buffer zone between the hot plasma and the reactor wall, where excess heat and particles are expelled. I learned that the OSL plays a vital role in managing heat loads, guiding impurity removal, and extending the lifetime of the first wall. Technologies related to the OSL also involve the design and positioning of divertors to effectively control the particle and heat flow in this region.</p> <p>From the perspective of my own field—materials engineering—I also gained a deeper understanding of the material requirements for filters (such as neutron and high-energy particle shielding), as well as the demanding performance criteria for the first wall and structural components, including high-temperature resistance, radiation tolerance, and thermal expansion compatibility. These insights not only enhanced my understanding of the integrated design of fusion systems but also provided a valuable foundation for my future research in advanced material development.</p>		

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	<p>3. 他国の参加者との交流状況について</p> <p>During the school, I had many valuable opportunities to interact with participants from other countries and institutions. For example, I had discussions with Mr. Li from NIFS (National Institute for Fusion Science), Mr. Jason from Yamato Gokin, and Mr. Yamashita from Metal Technology Co., Ltd. (Kin-Zoku Giken) about our research ideas related to fusion physics and materials science.</p> <p>We also shared meals together, which gave us time to talk more deeply about our respective research topics, current challenges, and future goals. Through these conversations, we gained a better understanding of each other's work and perspectives. I was especially inspired by the chance to communicate with researchers from different backgrounds—it really broadened my outlook and gave me fresh motivation for my own studies.</p> <p>I'm happy to say that these interactions not only enhanced my academic experience but also led to meaningful friendships. I believe these connections will be valuable for future research collaboration.</p> <p>4. 自分自身の今後の研究・職務等への効果について</p> <p>Attending the ITER school helped me realize the importance of understanding plasma behavior and Tokamak system design in greater depth. As my research focuses on 11Cr ODS alloys for fusion reactor applications, this knowledge is essential.</p> <p>I learned how components like the first wall and scrape-off layer (OSL) are exposed to extreme heat and radiation, which directly relates to my study of oxide particle dispersion and its effect on material performance. Going forward, I will integrate plasma-related knowledge into my research to better design and evaluate ODS alloys under conditions relevant to Tokamak environments.</p> <p>5. その他、特筆すべき事項、重要な課題、スクールの感想、事業への要望等</p> <p>I would definitely like to join the next ITER school if I have the opportunity. This time, I felt that I was not fully prepared due to the short notice, and I realized that my understanding of plasma physics is still quite limited. As a result, I had some difficulty following certain lectures.</p> <p>If there were more hands-on or practical sessions offered in the future, I would be very eager to participate. I believe that applying concepts through real or simulated experiences would greatly enhance my understanding.</p> <p>Currently, I am a second-year PhD student majoring in materials science, focusing on metallic materials. While my current research is not directly in plasma physics, I am deeply passionate about nuclear fusion and truly hope to enter this field after graduation. This school has further inspired me to bridge my knowledge of materials with the needs of fusion reactors, and I would love to continue contributing to this exciting and meaningful area of science in the future.</p>
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