

## From neutrons to knowledge

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Research reactors play a pivotal role in transforming fundamental nuclear particles into powerful tools for scientific discovery and societal advancement. Unlike power reactors, these facilities are specifically designed to produce high fluxes of neutrons that can be harnessed for a wide range of applications. This paper explores the journey “from neutrons to knowledge,” highlighting how research reactors enable breakthroughs in fields such as materials science, medicine, energy, and environmental studies. Through techniques like neutron scattering and neutron activation analysis, researchers can probe the structure and behavior of matter at the atomic level, providing insights that are often unattainable by other methods. Additionally, research reactors contribute to the production of medical isotopes essential for diagnostics and cancer treatment, as well as to the training of skilled scientists and engineers. By examining both the scientific capabilities and the broader impacts of these facilities, this work underscores the enduring importance of research reactors as engines of innovation and the development of next-generation systems, including small modular and advanced reactors. At the same time, they support applications in environmental monitoring, isotope production, radiation protection, and nuclear security, demonstrating their broad societal relevance and knowledge generation in the modern world.

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