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PARTREC Facility

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After 25 years of successful research in the nuclear and radiation physics and biology domain, the KVI-CART research center in Groningen has been re-focussed and re-established as the open access UMCG PARticle Therapy Research Center (PARTREC). Using the superconducting cyclotron AGOR and being embedded within the University Medical Center Groningen, it operates in synergy with the clinical Groningen Proton Therapy Center, providing an integrated bench to bed and back approach. PARTREC uniquely combines radiation physics, medical physics, radiation biology and radiotherapy research with an R&D program to improve hadron therapy technology and advanced radiation therapy for cancer. A number of further upgrades, scheduled for completion in 2023, will establish a wide range of irradiation modalities, such as pencil beam scanning, shoot-through with high energy protons and SOBP for protons, helium and carbon ions. Delivery of spatial fractionation (GRID) and dose rates over 300 Gy/s (FLASH) are envisioned, while FLASH beams (over 60 Gy/s) have been already realized. In addition, PARTREC delivers a variety of proton, light and heavy ion beams delivered in three separatee beamlines, as well as infrastructure for radiation hardness experiments conducted by academic and industrial communities, and nuclear science research in collaboration with the Faculty of Science and Engineering of the University of Groningen.

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