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Overview of Inertial Fusion Energy research in Europe[1] PETER NORREYS, University of Oxford and UKRI-STFC Rutherford Appleton Laboratory — I am leading a European consortium, funded under the EUROFusion Enabling Research grant entitled Routes to High Gain Inertial Fusion Energy (RHoGIFE), comprising sixty eminent physicists from fifteen laboratories in nine nations. We are undertaking a series of collaborative experiments on existing European facilities to qualify new diagnostics, instruments and techniques, in preparation for deployment on PETAL/LMJ facility in the next decade. We have three main objectives: a) studying fundamental materials properties and laser-plasma interactions to acquire new insights into basic physics for ignition on MJ-scale facilities b) critically evaluating advanced alternative schemes for the high gain target designs that are required for inertial fusion energy, including the exciting new auxiliary heating approach developed by our consortium; and c) developing key IFE innovative materials, lasers and target fabrication technologies. I will describe key advances made by our consortium, concentrating on fundamental atomic physics, CBET and RT instability studies, auxiliary heating and alternative ignition schemes (electron- and ion- fast ignition).

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