

# DECAY SPECTROSCOPY AT RIBF - THE EURICA PROJECT

G. Lorusso<sup>1</sup>, S. Nishimura<sup>1</sup>, H. Baba<sup>1</sup>, F. Browne<sup>2</sup>, P. Doornenbal<sup>1</sup>, G. Gey<sup>3</sup>, T. Isobe<sup>1</sup>, H.S. Jung<sup>4</sup>, I. Kojouharov<sup>5</sup>, N. Kurz<sup>5</sup>, Y.K. Kwon<sup>6</sup>, Z. Li<sup>7</sup>, K. Moschner<sup>8</sup>, H. Nishibata<sup>9</sup>, H. Sakurai<sup>1,10</sup>, H. Schaffner<sup>5</sup>, P.-A. Söderström<sup>1</sup>, K. Steiger<sup>11</sup>, T. Sumikama<sup>12</sup>, J. Taprogge<sup>13</sup>, Z. Vajta<sup>14</sup>, J. Wu<sup>1,7</sup>, Z. Xu<sup>10</sup>, A. Yagi<sup>9</sup>, K. Yoshinaga<sup>1,14</sup>, and the EURICA collaboration

<sup>1</sup> *RIKEN Nishina Center, Wako, Japan*

<sup>2</sup> *School of Environment and Technology, University of Brighton, Brighton, UK*

<sup>3</sup> *Universite Joseph Fourier Grenoble, Grenoble, France*

<sup>4</sup> *Department of Physics, Chung-Ang University, Seoul, Republic of Korea*

<sup>5</sup> *GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt, Germany*

<sup>6</sup> *Institute for Basic Science, Daejeon, Republic of Korea*

<sup>7</sup> *Department of Physics, Peking University, Beijing, China*

<sup>8</sup> *University of Koln, Koln, Germany*

<sup>9</sup> *Department of Physics, Osaka University, Osaka, Japan*

<sup>10</sup> *Department of Physics, University of Tokyo, Tokyo, Japan*

<sup>11</sup> *Physik Department E12, Technische Universität München, München, Germany*

<sup>12</sup> *Department of Physics, Tohoku University, Japan*

<sup>13</sup> *Instituto de Estructura de la Materia Consejo Superior de Investigaciones Científicas, Madrid, Spain*

<sup>14</sup> *Institute of Nuclear Research of the Hungarian Academy of Sciences, Debrecen, Hungary*

<sup>15</sup> *Department of Physics, Tokyo University of Science, Noda, Chiba, Japan*

$\beta$ -decay spectroscopy is a powerful tool to investigate the evolution of nuclear structure toward extreme neutron-to-proton ratios. Decay properties of neutron-rich nuclei are also essential to model the astrophysical rapid-neutron-capture process (r- process), one of the main nucleosynthesis processes operating in the universe.

The recent beam developments at RIBF, along with the installation of the EUROBALL  $\gamma$ -ray detector have made new exotic proton- and neutron-rich regions of the nuclear chart accessible to decay-spectroscopy experiments. The EURICA project (EUROBALL RIKEN Cluster Array) has been launched in 2012 with the goal of performing spectroscopy in these regions. EURICA is a high priority project for RIBF, made possible thanks to the contribution of a worldwide nuclear physics community.

Four experimental campaigns have been successfully performed using fragmentation of  $^{124}\text{Xe}$  beam and in-flight-fission of  $^{238}\text{U}$  beam in the vicinity of key nuclei such as  $^{78}\text{Ni}$ ,  $^{128}\text{Pd}$ ,  $^{138}\text{Sn}$ ,  $^{100}\text{Sn}$ , and  $^{158}\text{Nd}$ . This contribution highlights the experiments performed and the future perspective of the EURICA project.