

**S. Heinz**  
**for the SHIP and IONAS collaborations**

### **SUPERHEAVY ELEMENT RESEARCH AT THE VELOCITY FILTER SHIP**

The Separator for Heavy Ion Reaction Products (SHIP) is a velocity filter located at the UNILAC accelerator of GSI Darmstadt, Germany. For about 35 years a broad experimental program in the field of superheavy element research is running at SHIP. During the last years particularly investigations in the region of the heaviest known nuclei were performed. In fusion reactions of  $^{48}\text{Ca} + ^{248}\text{Cm} \rightarrow ^{296}116^*$  a total of six decay chains was observed which could be attributed to the evaporation residues  $^{292}116$  and  $^{293}116$ . In this experiment, data measured previously on the same isotopes in Dubna were well confirmed. Besides, two attempts were made to synthesize isotopes of the still unobserved element  $Z = 120$  in reactions of  $^{64}\text{Ni} + ^{238}\text{U}$  and  $^{54}\text{Cr} + ^{248}\text{Cm}$ . No events were observed in these experiments leading to one-event cross-section limits of 90 and 560 fb, respectively. For future superheavy element research, a new superconducting continuous wave LINAC is planned at GSI which shall deliver beam intensities of up to  $10^{14}$  particles per second. In this context we are developing a next generation separator and new detection techniques.

*Keywords:* fusion reaction, superheavy elements,  $Z = 116$ ,  $Z = 120$ .