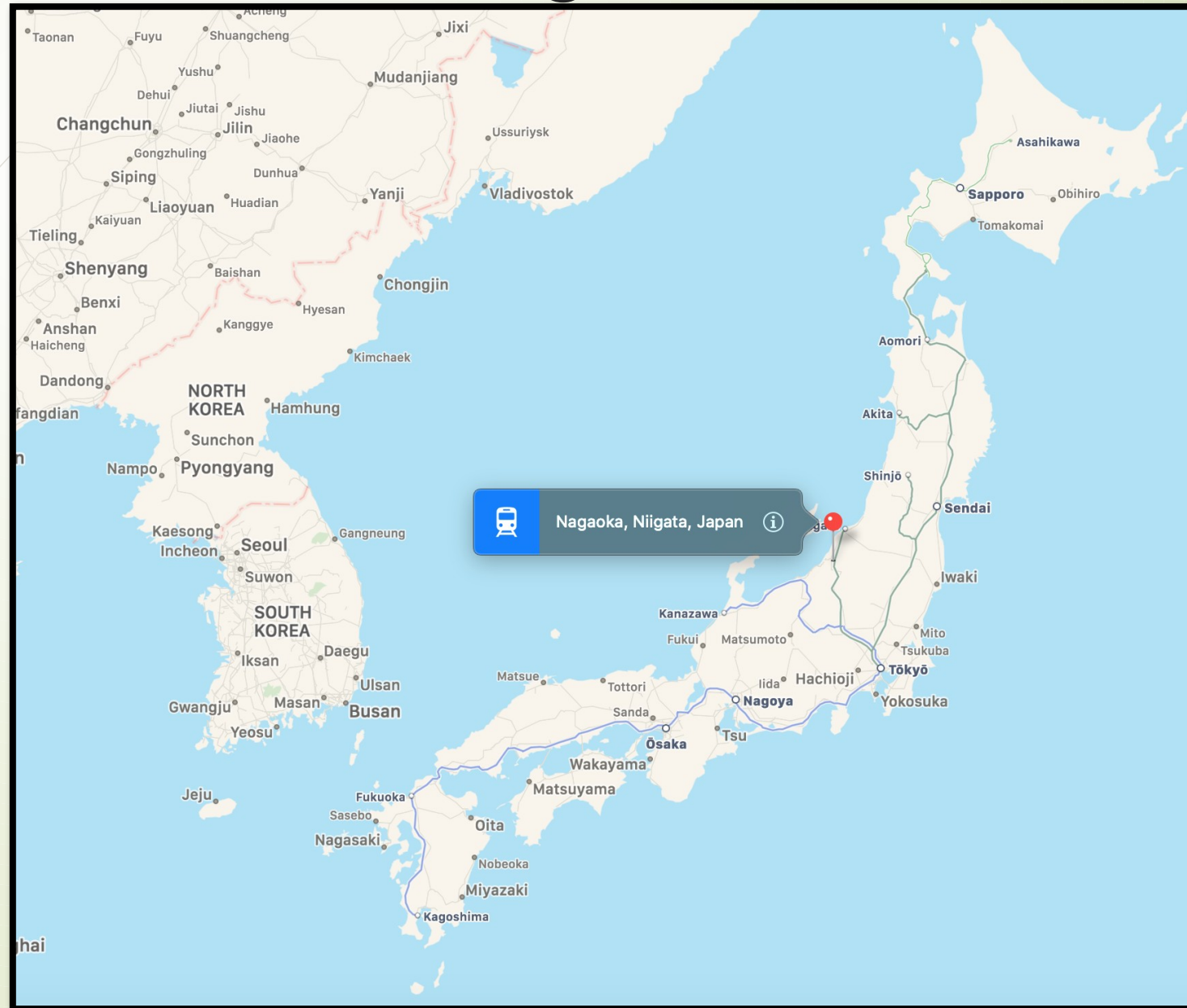


Nagaoka University of Technology - Japan

Aufenthaltsbericht von Daniel Kreuter

Nagaoka





Die Universität



Kurse an der NUT

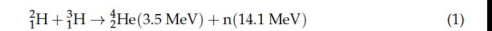
- Engineering Kurse
- Nuclear System Safety Engineering
 - Advanced Nuclear Criticality
 - Nuclear Fusion Systems
 - Advanced Course on Nuclear Structure and Materials
- Japanisch Kurse
 - Intensive & Basic
 - Kanji

Difficulties in the Realization of Nuclear Fusion Systems

Daniel Kreuter - 18906388
Homework Report - Nuclear Fusion Systems

July 6, 2019

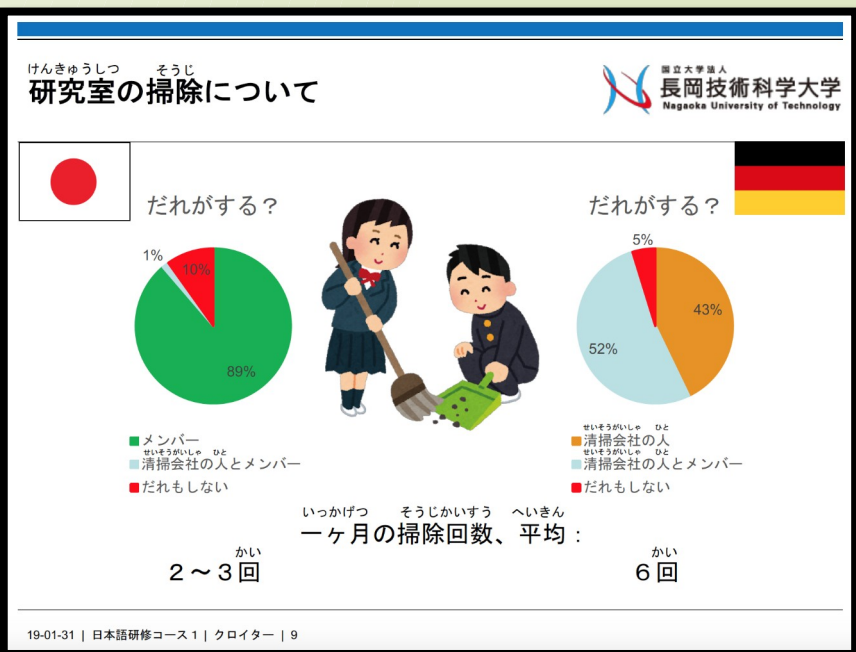
It is tempting to realize the controlled nuclear fusion processes happening in the sun, and to whom we owe our lives, in a fusion reactor power plant here on earth. The released energy per fused mass is substantially higher than in nuclear fission processes. Unsurprisingly then, a lot of effort has been put into nuclear fusion research in the last 50 years without the construction of a successful nuclear reactor. Though many advances have been made it will likely still take many years before a technically feasible reactor is in use. The great difficulty in constructing such a reactor is keeping very high temperatures over long times in order for the fusion materials to have enough energy to penetrate the Coulomb barrier as well as enough time for multiple fusions to occur. The most promising fusion reaction is that of deuterium and tritium



which releases around 17.6 MeV per fusion reaction as kinetic energy on the neutron and the α -particle.

1 General Requirements

To overcome the Coulomb barrier the fusion materials must have a high enough kinetic energy. [Figure 1] shows the relationship between the deuteron energy and the reaction cross-section.



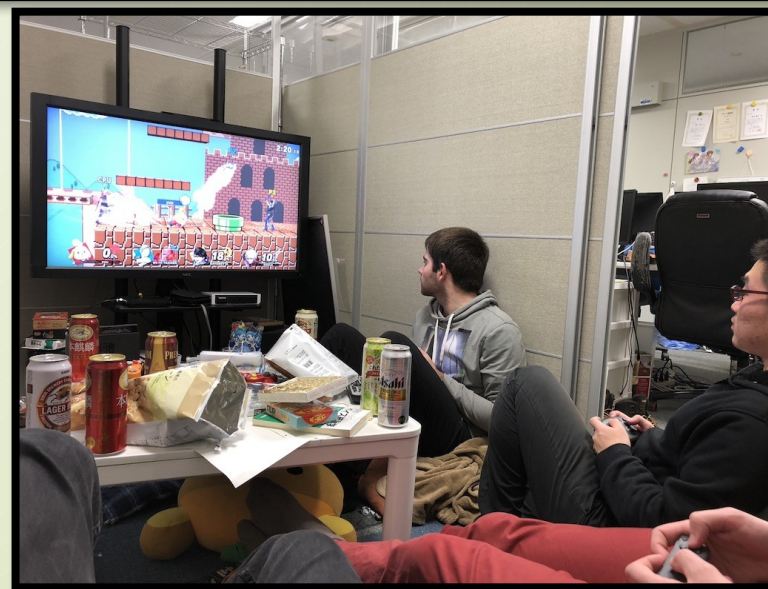
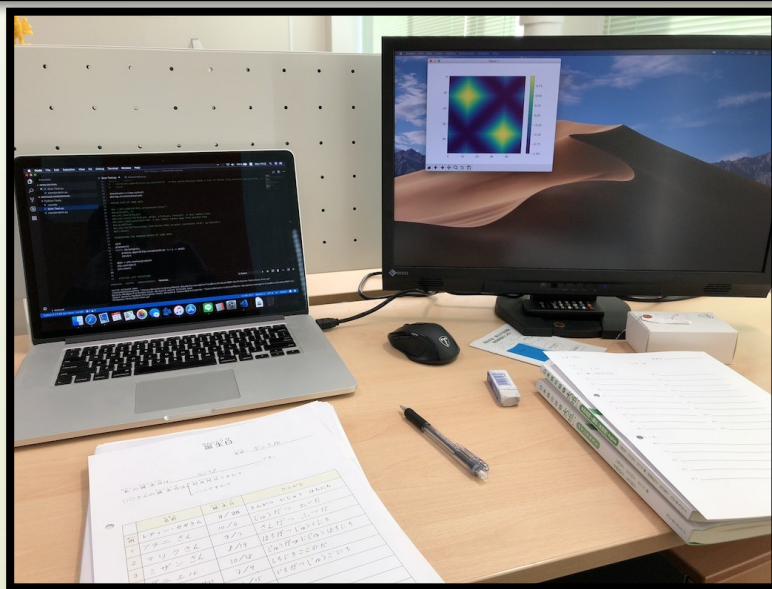


Leben in Japan

Studentenwohnheim



Lab Kultur





Convinience

Essen



Fazit: Darf ich nochmal?

