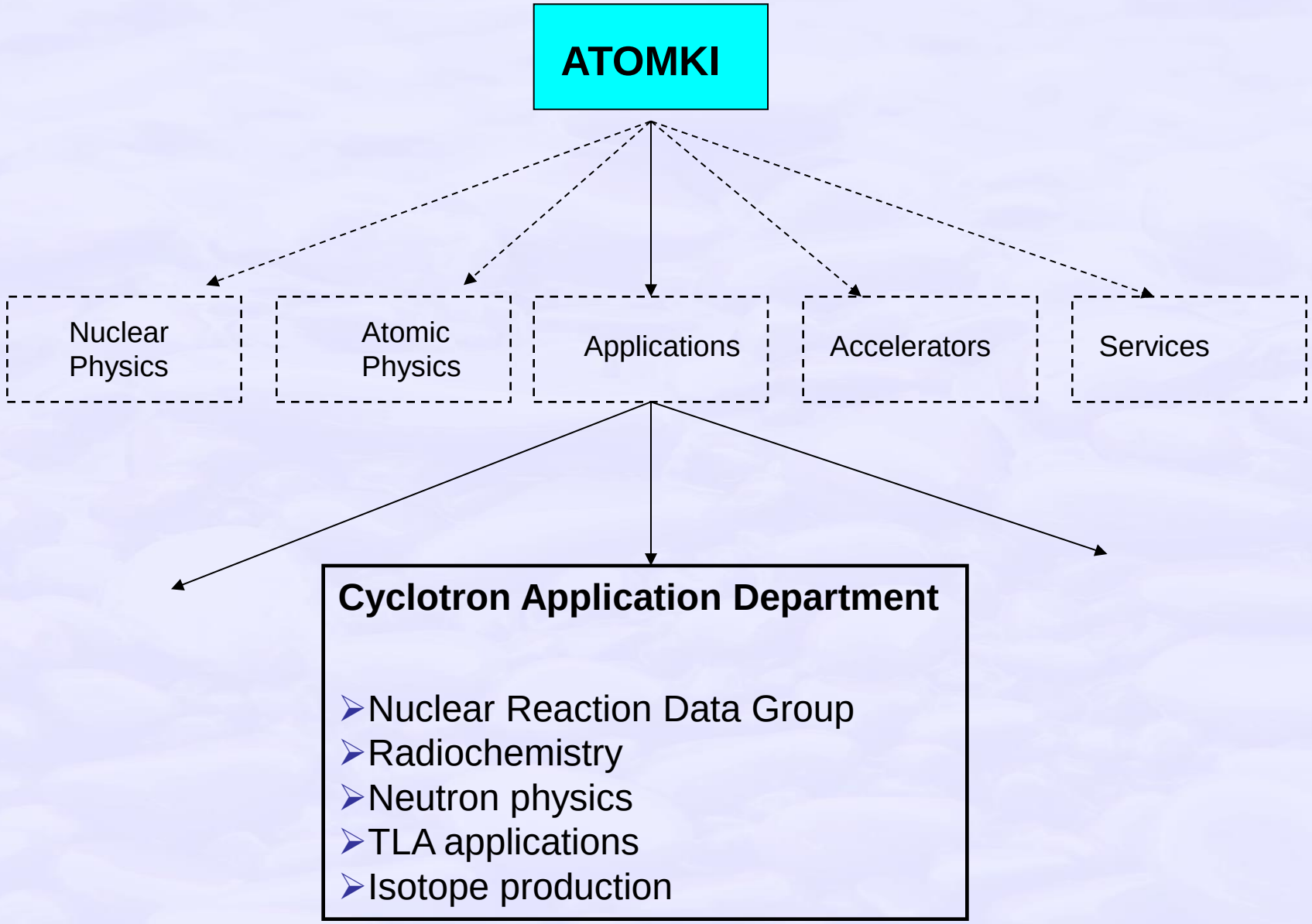
Progress Report of

NUCLEAR REACTION DATA GROUP at ATOMKI

2016

(S. Takács)

NRDC Meeting, June 7-10, 2016, Beijing, China


ATOMKI
Nuclear Physics
Atomic Physics
Applications
Accelerators
Services
Cyclotron Application Department
Nuclear Reaction Data Group
Radiochemistry
Neutron physics
TLA applications
Isotope production

Nuclear Data Group

- **New activation cross section data measurements** **p, d, ^{3}He, α,**
  Cross section data were measured for proton beams up to 65 MeV, deuteron beams up to 50 MeV, alpha particle beams up to 50 MeV and 3He particles up to 28 MeV.
- **Collaboration,** Belgium, Germany, Japan, Russia
- **Compilation of experimental data**
- **Evaluation of experimental data**
- **EXFOR compilation**
- **Benchmarking, TTY experiments**

Staff members

Experimental physicists	3+1 (+1)
Radio-chemists	1
Technicians	2+1
EXFOR compiler	1

Aim of the measurements is to provide cross section data for

Applications

- Isotope production
  - Medical
  - Industrial
    - Monitor processes
    - Test materials
  - Agricultural
  - Environmental tracing
- Input data for nuclear applications
  - Accelerator technology
  - Monitor reactions
  - Energy production

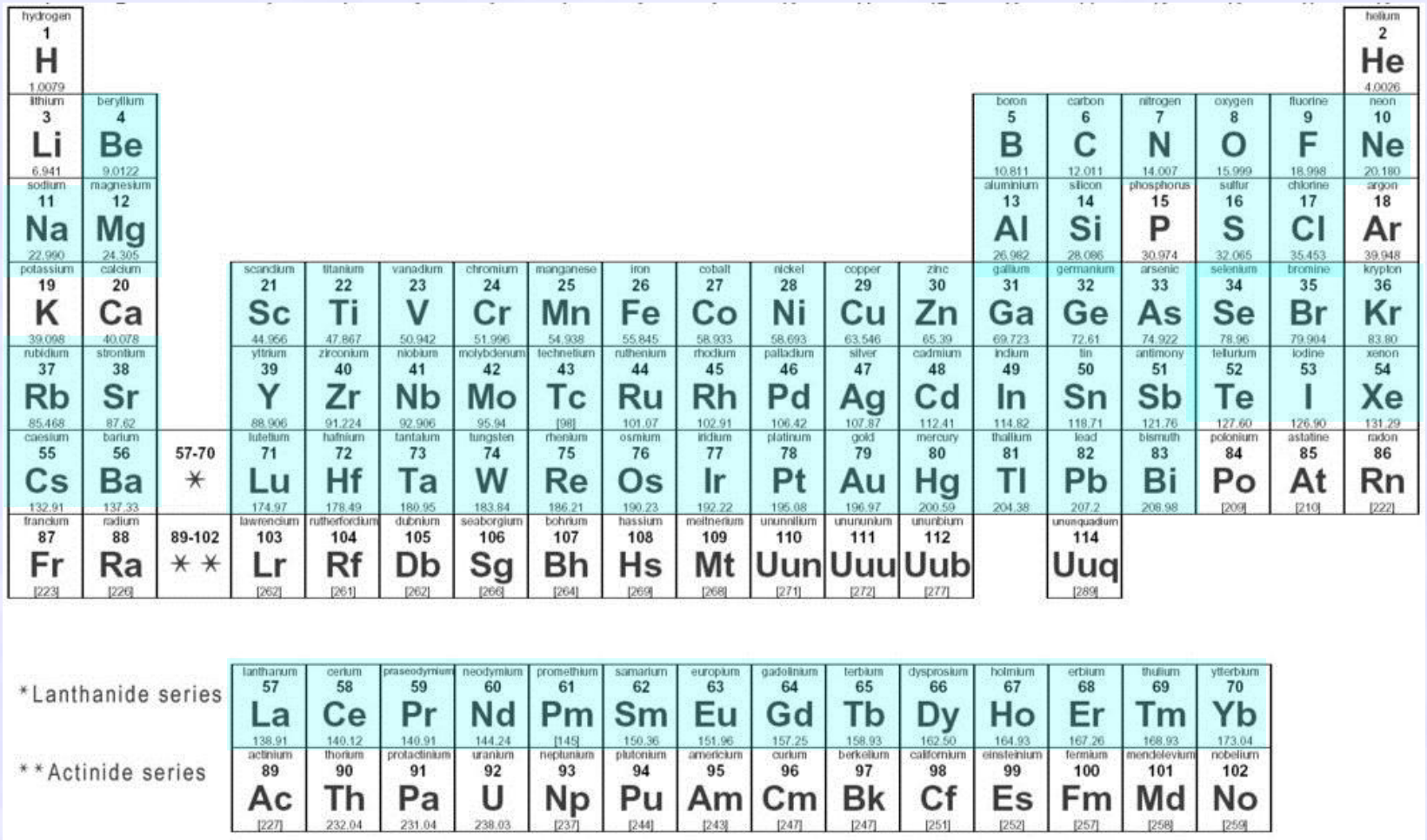
Basic research

- Develop theoretical models
- Astrophysics

Experimental work

- Systematic investigations of excitation functions
- Charged particle induced nuclear reactions
- Isotope production
- Optimizing production of radioisotopes for use in diagnostic and radiotherapy treatments
- Thin Layer Applications

Investigated target elements



EXFOR compilation in 2016

Our responsibility to compile experimental data of charged particle induced nuclear reactions reported from Debrecen,
Brussels,
Jülich

Number of new entries:	22
Number of subentries with new data:	181
Number of data lines:	3819

Participations in CRPs

- Nuclear Data for Charged-particle Monitor Reactions and Medical Isotope Production (2012–2016)
- Therapeutic Radiopharmaceuticals Labeled with New Emerging Radionuclides (67Cu, 186Re, 47Sc), (2016-2019)

Publications in 2016

- **Ali B. M., Al-Abyad M., Seddik U., El-Kameesy S. U., Ditrói F., Takács S., Tárkányi F.:** *Experimental investigation and theoretical calculation for 3He induced nuclear reactions on vanadium*. **NIM/B 373 (2016)76**
- **Amjed N, Hussain M., Aslam M. N., Tárkányi F., Qaim S. M.:** *Evaluation of nuclear reaction cross sections for optimization of production of the emerging diagnostic radionuclide ^{55}Co.* **ARI 108 (2016)38-48**.
- **Ditrói F., Tárkányi F., Takács S., Hermanne A**.: *Activation cross sections of proton induced nuclear reactions on gold up to 65 MeV*. **ARI 113 (2016)96**
- **Ditrói F., Tárkányi F., Takács S., Hermanne A., Ignatyuk A. V.:** *Activation cross sections of deuteron induced reactions on niobium in the 30-50 MeV energy range.* **NIM/B 373 (2016)17-27**
- **Hermanne A., Tárkányi F., Takács S., Ditrói F., Szûcs Z.** : *Activation cross sections of deuteron-induced nuclear reactions on mercury up to 50 MeV*. **JRN 308 (2016)221**
- **Hermanne A., Tárkányi F., Takács S., Ditrói F., Szûcs Z., Brezovcsik K.** : *Experimental cross-sections for proton induced nuclear reactions on mercury up to 65 MeV.* **NIM/B 378 (2016)12**
- **Tárkányi F., Ditrói F., Hermanne A., Takács S., Baba M.:** *Investigation of activation cross sections of proton induced reactions on indium up to 70 MeV for practical applications.* **ARI 107 (2016)391-400**.
- **Tárkányi F., Ditrói F., Takács S., Hermanne A., Baba M., Ignatyuk A. V**.: *Excitation functions for (d,x) reactions on 133Cs up to Ed=40 MeV*.. **ARI 110 (2016)1:109-117**

- **Takács S., Ditrói F., Aikawa M., Haba H., Otuka N**.: *Benchmark experiment for the cross section of the $^{100}Mo(p,2n)^{99m}Tc$ and $^{100}Mo(p,pn)^{99}Mo$ reactions.* **NIM/B 375 (2016)60**

- **Kovács Z., Szelecsényi F., Brezovcsik K.** : *Preparation of thin gadolinium samples via electrodeposition for excitation function studies*. **JRN 307 (2016)3:1861-1864**

- **Szelecsényi F., Steyn G. F., Kovács Z.** : *On the formation of non-radioactive copper during the production of ^{64}Cu via proton and deuteron-induced nuclear reactions on enriched ^{64}Ni targets.* **JRN 307 (2016)3:1841-1846**

- **Szelecsényi F., Kovács Z., Kotaro Nagatsu., Ming-Rong Zhang., Kazutosi Suzuki**.: *Investigation of deuteron-induced reactions on natGd up to 30 MeV: Possibility of production of medically relevant ^{155}Tb and ^{161}Tb radioisotopes.* **JRN 307 (2016)3:1877-1881**

- **Alaa Elbinawi., Al-Abyad M., Abd-Elmageed K. E., Hassan K. F., Ditrói F.** : *Proton induced nuclear reactions on natural antimony up to 7 MeV*. **RCA 104 (2016)221**

- **Solieman A. H. M., Al-Abyad M., Ditrói F., Saleh Z. A**.: *Experimental and theoretical study for the production of ^{51}Cr using p, d, ^{3}He and ^{4}He projectiles on V, Ti and Cr targets.* **NIM/B 366 (2016)19(27)**

Thank you