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KAZAKH NATIONAL
UNIVERSITY**



Recent Activity of CA-NRDB

April 21-23, 2015

**A. Zhunisbek, M. Takibayeva, V. Kurmangalyeva,
N. Kenzhebeyev, F. Ergashev**

Central Asian Nuclear Reaction Database (CA-NRDB)

NRDC 2015 Meeting, Vienna, Austria

Main objectives

- CA-NRDB work group
- Compilation
- Research and Evaluation
- Website development
- Database development
- International collaboration
- Nearest plans and activity



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CA-NRDB work group:

- 1) *V. Kurmangalyieva* – head
- 2) *N. Takibayev* – advisor
- 3) *A. Zhunisbek* – technical specialist, compiler
- 4) *M. Takibayeva* – technical specialist, compiler
- 5) *F. Ergashev* – compiler
- 6) *A. Mukhamedjanova* – editor, proof-reader, education section



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Compilation

After May 2014 we compiled 6 articles:

Entry #	First author	Article	Lab.	Status
31738	Yu.N.Koblik	J,AE/T,116,401,2014	4UZ UZB	TRANS.3163
D0744	A.Duisebaev	J,BAS,78,601,2014	4KASKAZ	In EXFOR
D0745	B.N.Gikal	J,PPN/L,11,462,2014	4KASKAZ	TRANS.D096
D0751	Sh.Hamada	J,IMP/E,22,1350058,2013	4KASKAZ	TRANS.D096
D0697	S.I.Mulgin	J,NP/A,824,1,2009	4UZ UZB	In EXFOR
D0712	N.Burtebayev	J,NP/A,909,20,2013	4KASKAZ	TRANS.D093



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Research and Evaluation

Young researchers of our group take part in following scientific researches:

- **Nuclear reactions in astrophysics;**
- **Neutron resonances in neutron star crusts;**
- **Neutrons and light nuclei in nuclear research installations.**

Advisors: prof. *Kiyoshi Kato* (Hokkaido University), *N. Burtebayev* (Institute of Nuclear Physics, RK), *N. Takibayev* (al-Farabi KNU, RK)

These projects are supported by MES RK.

Functioning of CA-NRDB is approved by KAEC.



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Website development

CA-NRDB website is being formed in three languages – Kazakh, English and Russian

Components of website: MS .Net Framework 4.5 + MS SQL Server 2008 + C# (MS Visual Studio 2010)

MS .NET Framework - is a software framework that includes a large class library known as Framework Class Library and provides language interoperability across several programming languages.

MS SQL Server - it is a software product whose primary function is to store and retrieve data as requested by other software applications, be it those on the same computer or those running on another computer across a network.

C# - is a multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines.

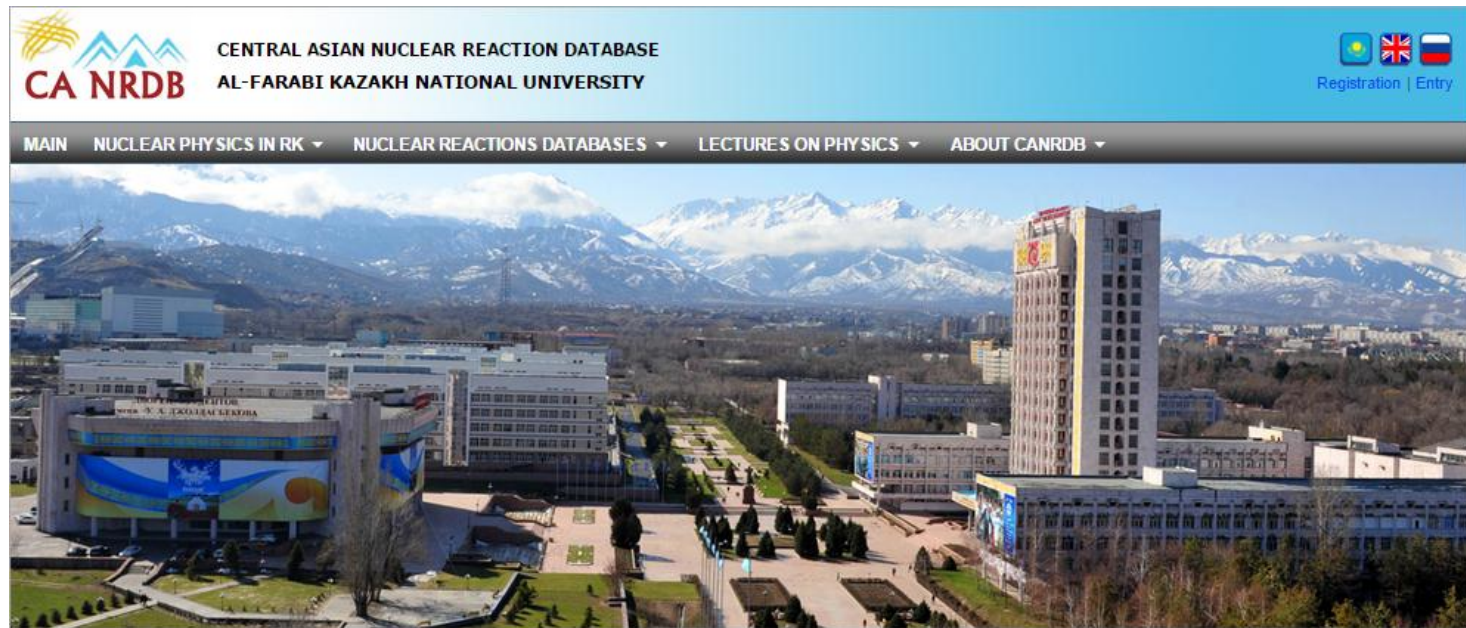
Advantages:

Performance: A multilevel streaming and relational input/output of massive data.

Education section: An extensive electronic library to incorporate textbooks, presentations, lectures, scientific papers, etc.

Website development (cont.)

Main page (top view):



SCIENCE NEWS

Al-Farabi Kazakh National University is the leading institution of the system of higher education of the Republic of Kazakhstan, which was the first to pass the state certification and which has justified its right to realize academic activity on all specialties and at all levels.

The University has an enormous educational, scientific, spiritually educational, innovative and production potential which is aimed to the training of specialists of the highest qualification, further integration into the global educational space, development of fundamental and applied research, their implementation into production. Today Al-Farabi KazNU offers you a wide range of specialties!



Website development (cont.)

Main page (bottom view):

SCIENCE NEWS

The Central Asian Nuclear Reactions Data Base (CANRDB) was founded in April 2012 by the order of al-Farabi Kazakh National University rector Prof. G.M. Mutanov. The foundation of CANRDB was supported by the *Japanese Charged Particle Reaction Group* (Hokkaido University, Japan), *Centre For Photomuclear Experiments Data* (Lomonosov MSU, Russia) and *International Atomic Energy Agency (IAEA)*. CANRDB is a member of *International Network of Nuclear Reaction Data Centres (NRDC)* under the auspices of IAEA.

[Continuation ->](#)



PHOTO GALLERY

1 2 3 4 5 6 7 8 9 10



EVENT CALENDAR

April 2015

Mo	Tu	We	Th	Fr	Sa	Su
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

PARTNERS

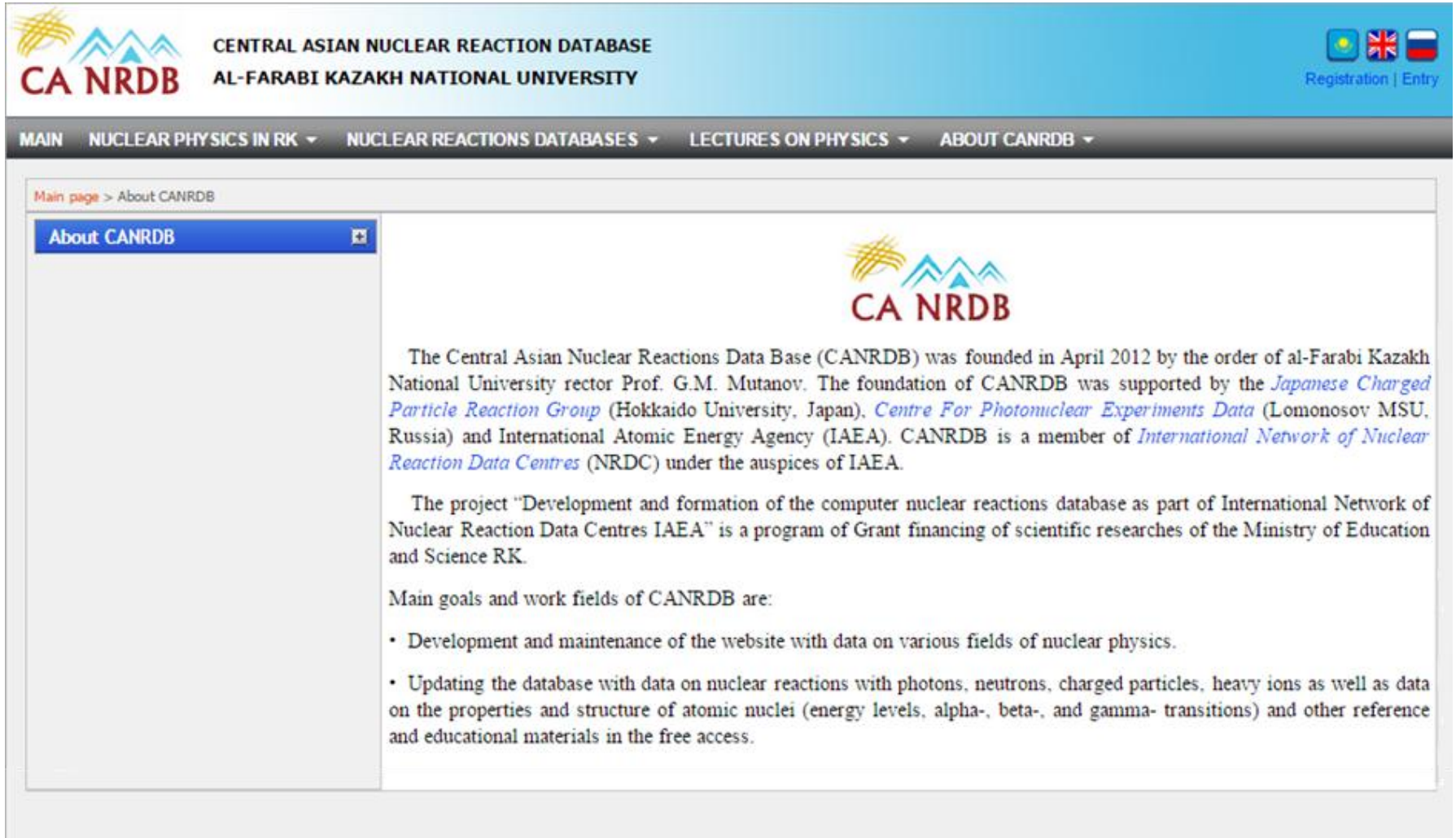




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Website development (cont.)

About CA-NRDB:



The screenshot displays the website for the Central Asian Nuclear Reaction Database (CANRDB). The header features the CA NRDB logo, the text "CENTRAL ASIAN NUCLEAR REACTION DATABASE" and "AL-FARABI KAZAKH NATIONAL UNIVERSITY", and flags for Kazakhstan, the UK, and Russia with "Registration | Entry" links. A navigation bar includes "MAIN", "NUCLEAR PHYSICS IN RK", "NUCLEAR REACTIONS DATABASES", "LECTURES ON PHYSICS", and "ABOUT CANRDB". The main content area shows a breadcrumb "Main page > About CANRDB" and a blue tab for "About CANRDB". The page content includes the CA NRDB logo, a paragraph about the database's founding in April 2012, and a list of main goals and work fields.

CA NRDB
CENTRAL ASIAN NUCLEAR REACTION DATABASE
AL-FARABI KAZAKH NATIONAL UNIVERSITY

Registration | Entry

MAIN NUCLEAR PHYSICS IN RK NUCLEAR REACTIONS DATABASES LECTURES ON PHYSICS ABOUT CANRDB

Main page > About CANRDB

About CANRDB

CA NRDB

The Central Asian Nuclear Reactions Data Base (CANRDB) was founded in April 2012 by the order of al-Farabi Kazakh National University rector Prof. G.M. Mutanov. The foundation of CANRDB was supported by the *Japanese Charged Particle Reaction Group* (Hokkaido University, Japan), *Centre For Photoneuclear Experiments Data* (Lomonosov MSU, Russia) and International Atomic Energy Agency (IAEA). CANRDB is a member of *International Network of Nuclear Reaction Data Centres* (NRDC) under the auspices of IAEA.

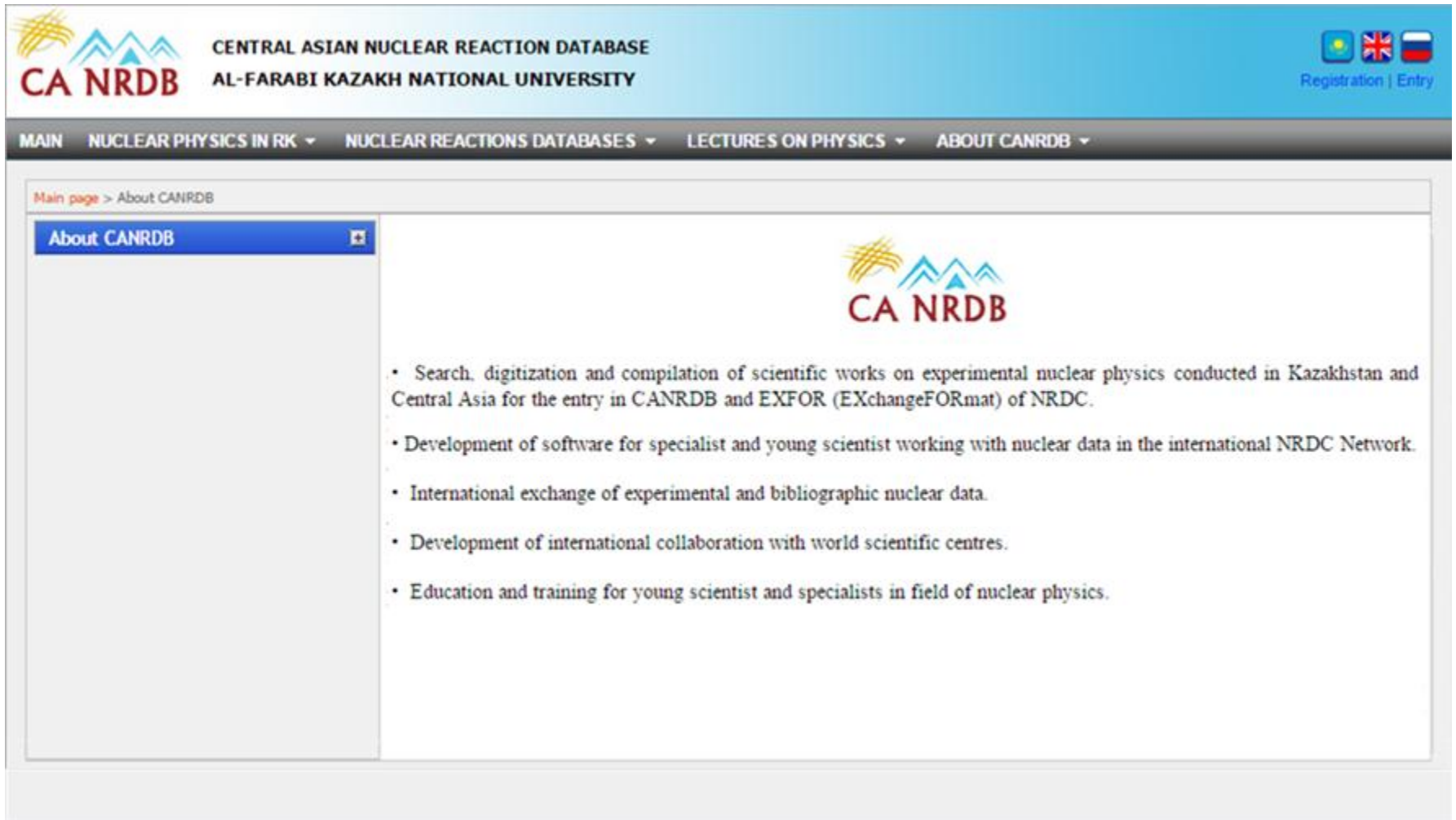
The project "Development and formation of the computer nuclear reactions database as part of International Network of Nuclear Reaction Data Centres IAEA" is a program of Grant financing of scientific researches of the Ministry of Education and Science RK.

Main goals and work fields of CANRDB are:

- Development and maintenance of the website with data on various fields of nuclear physics.
- Updating the database with data on nuclear reactions with photons, neutrons, charged particles, heavy ions as well as data on the properties and structure of atomic nuclei (energy levels, alpha-, beta-, and gamma- transitions) and other reference and educational materials in the free access.

Website development (cont.)

About CA-NRDB:



The screenshot displays the website for the Central Asian Nuclear Reaction Database (CA NRDB). The header features the logo on the left, the text 'CENTRAL ASIAN NUCLEAR REACTION DATABASE' and 'AL-FARABI KAZAKH NATIONAL UNIVERSITY' in the center, and flags for Kazakhstan, the UK, and Russia on the right with 'Registration | Entry' links. A navigation bar below the header contains links for 'MAIN', 'NUCLEAR PHYSICS IN RK', 'NUCLEAR REACTIONS DATABASES', 'LECTURES ON PHYSICS', and 'ABOUT CANRDB'. The main content area shows a breadcrumb trail 'Main page > About CANRDB' and a sidebar with 'About CANRDB' selected. The main text area contains the CA NRDB logo and a bulleted list of activities.

CA NRDB
CENTRAL ASIAN NUCLEAR REACTION DATABASE
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Registration | Entry

MAIN NUCLEAR PHYSICS IN RK NUCLEAR REACTIONS DATABASES LECTURES ON PHYSICS ABOUT CANRDB

Main page > About CANRDB

About CANRDB

CA NRDB

- Search, digitization and compilation of scientific works on experimental nuclear physics conducted in Kazakhstan and Central Asia for the entry in CANRDB and EXFOR (EXchangeFORmat) of NRDC.
- Development of software for specialist and young scientist working with nuclear data in the international NRDC Network.
- International exchange of experimental and bibliographic nuclear data.
- Development of international collaboration with world scientific centres.
- Education and training for young scientist and specialists in field of nuclear physics.

Database development

Currently CA-NRDB is developing a local Nuclear reaction database

Components of database: Apache+MySQL+PHP (AMP System)

Apache – is a web server known for its stability. More than 65% of all websites on the internet use the Apache server. The use of the PHP and Apache helps created dynamic pages that result in a highly interactive application.

MySQL - highly capable relational database management system, that is usually used for running enterprise level sites with varying degrees of database complexities. Format of data in MySQL can be easily queried with the SQL language.

PHP - language that helps write all the dynamic content that can access the entire data stored in the MySQL database. PHP is a standard Apache module thus it easier to deploy AMP web applications.

Advantages:

Easy to code: relatively bug free and doesn't have to go through an exhaustive and time consuming process of fixing the bugs.

Local Development: Another huge advantage of using AMP is that a developer can build an app locally and then deployed it onto the web.

International collaboration

- **NNDC** – compilation and activity coordination of CA-NRDB
- **JCPRG, Hokkaido University** – joint research and compilation
- **CDFE, MSU** – experience exchange and education
- **University of Osaka** – joint research, education and student exchange
- **JAEA** – training of young specialists in Oarai, Tsukuba



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Nearest plans and activity

- Further development of educational sector of database (under the project task of MES RK)
- Research and compilation of data on neutron resonances in:
 - ✓ **nuclear physics and nuclear research installations**
 - ✓ **nuclear astrophysics**
 - ✓ **neutron resonances in overdense crystalline structures**



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Thank you!



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