

# Atomska i molekulska fizika u INIS informacionom sistemu

**Dr Bratislav Marinković**

**Institut za fiziku, Zemun,**

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**[bratislav.marinkovic@phy.bg.ac.yu](mailto:bratislav.marinkovic@phy.bg.ac.yu)**

# Plan izlaganja

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- Odakle interes za informacione sisteme?
- Istraživanje u oblasti IS u atomskoj sudarnoj fizici
- “Proizvodnja podataka”
- Kategorija *ATOMSKA I MOLEKULSKA FIZIKA* u INIS-u
- IAEA, ICAMDATA
- Zaključak

# AM Projects from 1980

- 1981/85 "Physics of Plasma Energetics - Binary Collisions of Electrons with Atomic Species" - Republic Council for Science, Serbia; principal investigator: M.M.Popovic
- 1986/90 "Atomic and Molecular Physics - Binary Collisions of Electrons with Atomic Species"- Republic Council for Science, Serbia; principal investigator: M.Kurepa
- 1991/95 "Binary Collisions of Atomic Particles - Measurements of Electron Differential Cross Sections by Atomic Particles" - Ministry for Science and Technology, Republic of Serbia, No.E.0106; principal investigators: N.Djuric, M.V.Kurepa

**FOR MORE INFO...**

<http://www.phy.bg.ac.yu/~centar3/acp.html>

# AM Projects from 1980

- 1996/2001 "Atomic and Molecular Physics - Experimental Physics of Atomic Particle Collisions" - Ministry for Science and Technology, Republic of Serbia, No.01E02; principal investigators: T.Grozdanov and B.Marinkovic
- 2002/2004 "Experimental investigation of laser and electron interaction with atoms, metal vapours and molecules" No.1424; principal investigator: B.Marinkovic

**FOR MORE INFO...**

<http://www.phy.bg.ac.yu/~marinkov>

# 2002/2004 EIS (Expert and Information Systems in AM)

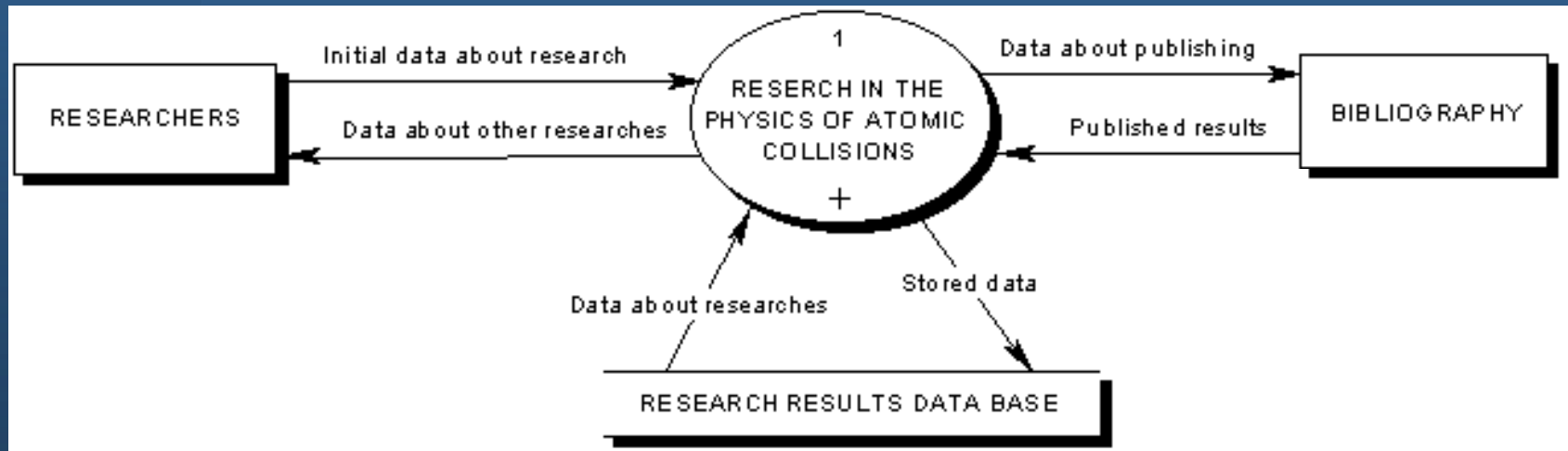
- Development of expert and information systems (EIS) in the field of atomic collisions (AC).
- Logical model of information system in AC and realization of the physical model.

## FOR MORE INFO...

- Logical Model of Information System in Atomic Collision Physics, M.Bilbija, B.Marinkovic, V.Cvjetkovic, V.Nikolic and V.Bocvarski, Proc. XIX SPIG, Zlatibor, Yugoslavia 1998, *Contributed Papers*, Eds. N.Konjevic, M.Cuk, I.R.Videnovic, (University of Belgrade, Faculty of Physics, Belgrade), 1998, pp.143-146
- Expert System Analysis of Electron-Atom Scattering Energy Loss Spectra, V. Cvjetkovic V.Bocvrski, and B.Radenkovic, *Expert Systems with Applicatons*.14 (1998) 275-282
- Online Expert System for Analysis of Inelastic Electron Scattering by Metal Atoms, V. Cvjetkovic, V. Bocvarski, *Computers Physics Communications* 120 (1999) 185-196

# 2002/2004 EIS (Expert and Information Systems in AM)

- Context diagram of the function RPAC



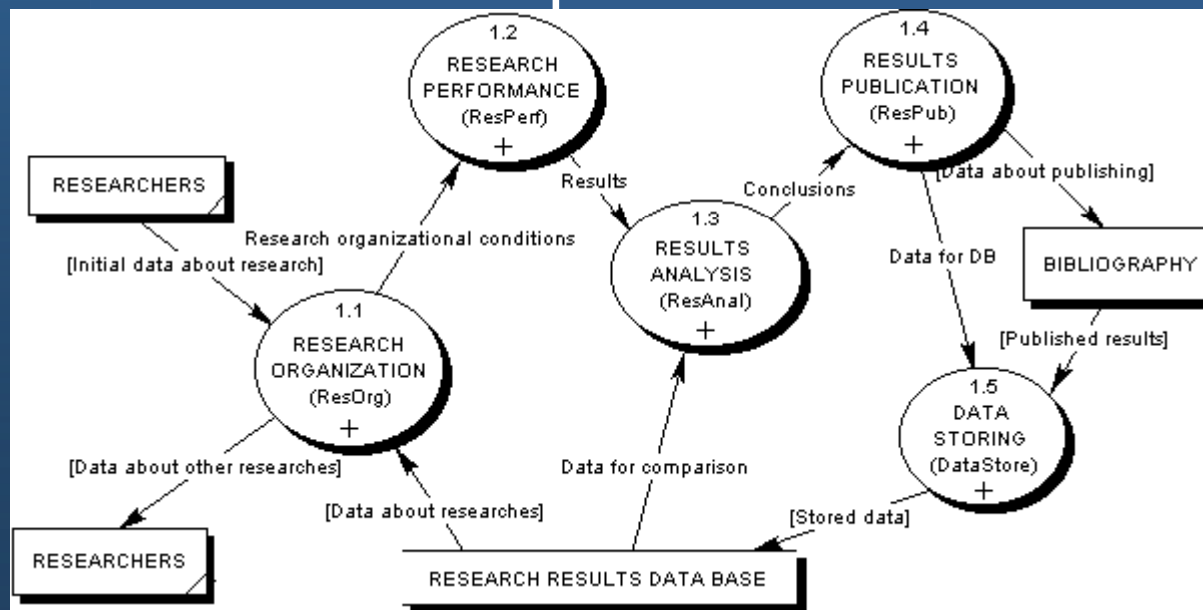
**FOR MORE INFO...**

<http://www.yuinfo.org.yu/>

- "Dekompozicija bibliografskih referenci u logičkom modelu informacionog sistema u fizici atomskih sudara", V.Cvjetković M.Bilbija, B.Marinković\* V. Bočvarski, and V. Nikolić, Proc.YUINFO 2002

# 2002/2004 EIS (Expert and Information Systems in AM)

- DFD of the decomposed RPAC function



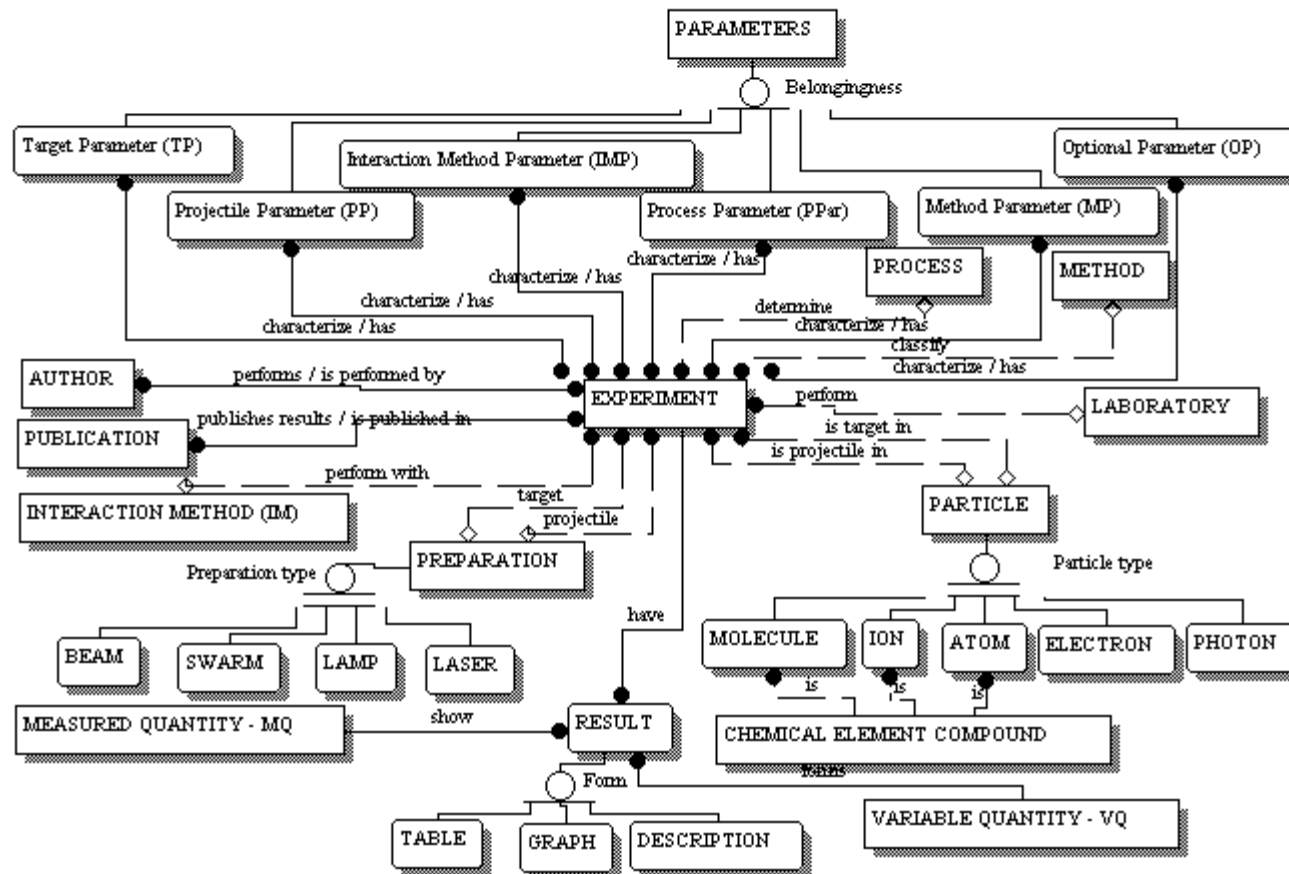
**FOR MORE INFO...**

<http://www.yuinfo.org.yu/>

- "Decomposition of Reference Texts in Logical Model of Information System in Atomic Collision Physics", V.Cvjetković M.Bilbija, B.Marinković\* V. Bočvarski, and V. Nikolić, Proc.YUINFO 2002

# 2002/2004 EIS (Expert and Information Systems in AM)

- Relational data model diagram





# 2002/2004 EIS (Expert and Information Systems in AM)

- Apparata for measuring cross sections in electron collision experiments

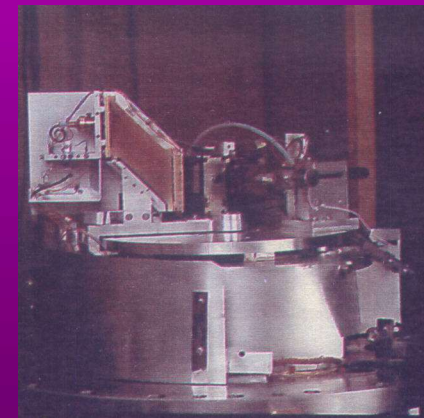
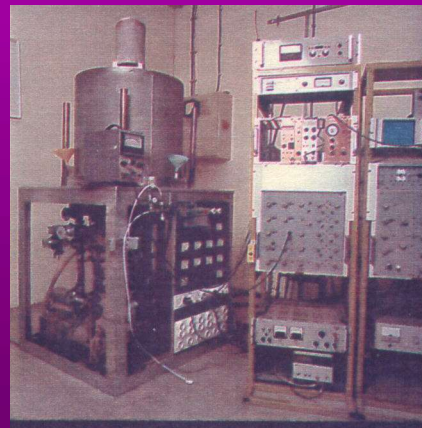
energy loss spectra

ESMA

UGRA

differential cross sections  
elastic scattering  
processes

ion angular distributions  
integral cross sections  
resonances



**FOR MORE INFO...**

<http://www.phy.bg.ac.yu/~centar3/acpproj2.html>

# Category AM in INIS

## ● Search No.    Records    Request

- # 1        6    Marinkovic in AU
- #2        6264    electron
- #3        3122    scattering
- #4        99    electron scattering
- #5        1    #1 and #4
- #6        1123    S74 in CC
- #7        1032    S74 in C1
- #8        91    #6 not #7
- #9        27    #4 and #7
- #10        842    "ELECTRON-BEAMS" in DE
- #11        23    #10 and #7

**Record 1 of 4 - INIS 2001/01-2001/09**

# Category AM in INIS

## ● Record 1 of 4 - INIS 2001/01-2001/09

- TI: Differential cross section minima in electron scattering by zinc atoms
- AU: Predojevic,-B. (Faculty of Natural Sciences, University of Banja Luka, Republic of Srpska (Bosnia and Herzegovina)); Sevic,-D.; Panajotovic,-R.; Pejcev,-V. (Institute of Physics, PO Box 57, 11001 Belgrade (Yugoslavia)); Filipovic,-D.M. (Faculty of Physics, University of Belgrade, PO Box 368, 11001 Belgrade (Yugoslavia)); Marinkovic,-B.P. (Institute of Physics, PO Box 57, 11001 Belgrade (Yugoslavia))
- CA: 20. Summer School and International Symposium on the Physics of Ionized Gases (20. SPIG) Zlatibor (Yugoslavia) 4-8 Sep 2000
- SO: Petrovic,-Z.Lj. (ed.) (Institute of Physics, P.O.Box 68, 11080 Zemun, Belgrade (Yugoslavia)); Kuraica,-M.M. (ed.); Malovic,-G. (ed.) (Faculty of Physics, University of Belgrade, P.O.Box 368, 11000 Belgrade (Yugoslavia)); Bibic,-N. (ed.) (Institute of Nuclear Sciences VINCA, Belgrade (Yugoslavia)) Contributed papers - 20. SPIG 3-5 November Belgrade (Yugoslavia) Institute of Physics, Faculty of Physics, Institute of Nuclear Sciences VINCA 2000 604 p. p. 35-38
- NT: 9 refs., 2 figs.
- PY: 2000
- LA: English
- CI: Yugoslavia

# Category AM in INIS

## ● Record 1 of 4 - INIS 2001/01-2001/09

- PT: B (Book); K (Conference); N (Numerical-Data)
- AB: Differential cross section (DCS) measurements were performed for both elastic and inelastic (excitation and autoionization) scattering of electrons by zinc atoms. Angular positions of DCS minima were determined in the impact energy range from 10 to 40 eV and scattering angles from 8.5 to 150 sup 0. Results are compared with available experimental and theoretical data. (authors)
- DEI: differential-cross-sections; elastic-scattering; electron-beams; electrons-; ev-range-10-100; experimental-data; impact-parameter; inelastic-scattering; spectroscopy; theoretical-data; zinc-
- DEC: beams-; cross-sections; data-; elementary-particles; elements-; energy-range; ev-range; fermions-; information-; lepton-beams; leptons-; metals-; numerical-data; particle-beams; scattering-
- IS: ISBN 86-7306-043-5
- CC: S74
- C1: S74
- CD: Atomic-and-molecular-physics
- UD: 3233
- AN: 32-038475

# Category AM in INIS

## ● Record 2 of 4 - INIS 2001/01-2001/09

TI: Investigation of VUV radiation excited by electron-zinc atom collisions.

OT: Doslyidzhennya VUF-vipromyinyuvannya, shcho zbudzhujet'sya pri zytiknennyakh elektronyiv z atomami tsinku.

AU: Bogachov,-G.G. (Yinstitut elektronnoyi fyiziki, Uzhgorod (Ukraine)

SO: Ukrayins'-kij-Fyizichnij-Zhurnal (Mar 2001) v. 46(3) p. 289-295

PY: 2001

LA: Ukrainian

CI: Ukraine

PT: J (Journal-Article)

AB: For the first time, using the electron-atom collision excitation method, the zinc atom emission VUV...

DEI: electron-beams; electron-atom-collisions; emission-spectra; ev-range-10-100; ev-range-100-1000; ultraviolet-radiation; zinc-

DEC: atom-collisions; beams-; collisions-; electromagnetic-radiation; electron-collisions; elements-; energy-range; ev-range; lepton-beams; metals-; particle-beams; radiations-; spectra-

CC: S74

C1: S74

CD: Atomic-and-molecular-physics

# Category AM in INIS

## ● Record 3 of 4 - INIS 2001/01-2001/09

TI: Differential ionization cross sections for rare gases

AU: Kim,-Yong-Ki (National Inst. of Standards and Technology, Gaithersburg, MD (United States)); Johnson,-Walter-R. (Dept. of Physics, Univ. of Notre Dame, Notre Dame, IN (United States)); Rudd,-M.E. (Dept. of Physics and Astronomy, Univ. of Nebraska, Lincoln, NE (United States))

CA: International seminar on atomic processes in plasmas Toki, Gifu (Japan) 29-30 Jul 1999

SO: Kato,-Takako; Murakami,-Izumi (eds.) National Inst. for Fusion Science, Nagoya (Japan) Proceedings of the international seminar on atomic processes in plasmas Jan 2000 223 p. p. 116-117

NT: 12 refs., 2 figs. Available from INIS in electronic form

RN: NIFS-PROC--44 (NIFSPROC44)

PY: 2000

LA: English

CI: Japan

PT: R (Report); K (Conference); E (Short-Communication)

DEI: binary-encounter-method; binding-energy; cross-sections; differential-cross-sections; electron-beams; helium-; ionization-; irradiation-; rare-gases

DEC: beams-; calculation-methods; cross-sections; elements-; energy-; fluids-; gases-; lepton-beams; nonmetals-; particle-beams; rare-gases

CC: S74

C1: S74

CD: Atomic-and-molecular-physics

# Category AM in INIS

## ● Record 4 of 4 - INIS 2001/01-2001/09

TI: Absolute total and partial cross-sections for ionization of Ba and Eu atoms by electron impact

AU: Yagi,-Shuichi; Nagata,-Tetsuo (Meisei Univ., Hino, Tokyo (Japan). Dept. of Physics

SO: Journal-of-the-Physical-Society-of-Japan (May 2000) v. 69(5) p. 1374-1383

NT: 28 refs., 9 figs., 1 tab.

PY: 2000

LA: English

CI: Japan

PT: J (Journal-Article)

AB: Experimental apparatus and procedure for measurements of absolute total (apparent and counting)... DEI: barium-; cross-sections; electron-beams; electron-atom-collisions; energy-level-transitions; europium-; ev-range-01-10; ev-range-100-1000; ionization-; irradiation-; time-of-flight-method

DEC: alkaline-earth-metals; atom-collisions; beams-; collisions-; electron-collisions; elements-; energy-range; ev-range; lepton-beams; metals-; particle-beams; rare-earths

IS: ISSN 0031-9015

CC: S74

C1: S74

CD: Atomic-and-molecular-physics

# IAEA's Nuclear Data Centre

- **Numerical nuclear physics data with related bibliographic information**
- **Nuclear Data Section/Atomic and Molecular Data Unit, Vienna, Austria**
  - General Internet Search Engine (GENIE) as a tool to allow a search for spectral and collisional atomic data for fusion and atomic physics research. The engine searches selected laboratories for specific atomic data and allows easy comparison and downloading.
  - The primary objective of the Atomic and Molecular Data Unit is to establish and maintain internationally recommended numerical databases on atomic and molecular collision and radiative processes, atomic and molecular structure characteristics, particle-solid surface interaction processes and physico-chemical and thermo-mechanical material properties for use in fusion energy research and other plasma science and technology applications. These numerical databases are now available from our *Aladdin* Database Server.
- **Related links:** <http://www-amdis.iaea.org/>



# ICAMDATA (at NIST site)

- **Purpose:** The International Conference on Atomic and Molecular Data and Their Applications (ICAMDATA) is a continuing series of international conferences that promotes the use of atomic and molecular (AM) data in various fields of science and technology, provides a forum for interaction of AM data producers and users and for information exchange on AM data needs and availability, and fosters cross-disciplinary cooperation between the AM data producers and users and the coordination of AM data activities and databases worldwide.
- **Scope:** ICAMDATA covers topics on AM data needs in various scientific and technological areas (such as aeronomy, astrophysics, biomedicine, gaseous electronics, surface physics, industrial plasmas, and environmental, fusion, semiconductor and other technologies), and the development of experimental and theoretical methods for AM data generation, AM data collection, assessment, exchange and dissemination activities, establishment of national and international general and purpose-oriented AM databases, standardization of data formats and assessment criteria and efficient utilization of modern data access and transmission tools (such as WWW and Internet).
- **Related links:** [Atomic, Molecular and Optical Physics Sites](#)  
[Atomic Databases, The Theoretical Atomic, Molecular and Optical Community \(TAMOC\)](#)

# People

- Dr Bratislav Marinković<sup>1</sup>
- Prof. dr Valerij Bočvarski<sup>2</sup>
- Dr Dragutin Šević<sup>1</sup>
- Dr Vladimir Cvjetković<sup>2</sup>
- Mr M. Bilbija <sup>2</sup>
- Jelena Janić<sup>2</sup>

## AFFILIATION

<sup>1</sup>Institute of Physics, Belgrade

<sup>2</sup>Faculty of Science, Univ. of Kragujevac

# Atomic and Molecular Physics represented in INIS information system

**Dr Bratislav Marinković**

**Institut za fiziku, Zemun,**

**13.03.2002. *E-mail:***

**[bratislav.marinkovic@phy.bg.ac.yu](mailto:bratislav.marinkovic@phy.bg.ac.yu)**