

*50 years of the IAEA Nuclear Data Section, 2 June 2014*

**NDS - Into a New Millennium**  
***(Recollections from 7 Years in Vienna)***

*Pavel Obložinský*

*IAEA Nuclear Data Section (1993-2000)*

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# From grey Bratislava to colourful Vienna

- I moved to Vienna on **1 June 1993**. Communism collapsed in November 1989, but 3.5 years later Bratislava looked the same – grey and dull. Vienna seemed to me to be a paradise city.
- It **looked simple**: cross the Danube and make 1 hour drive, reflecting modest distance between two gothic cathedrals: St. Martin in Bratislava (coronation place of 19 Hungarian kings and queens) and Stephansdom.
- I was used to live behind the Iron Curtain, crossing the border generated **extraordinary feelings**, it took me a year to accept this as something normal.



19 coronations in 1563-1830

*St. Martin - St. Stephan  
= 57.1km*



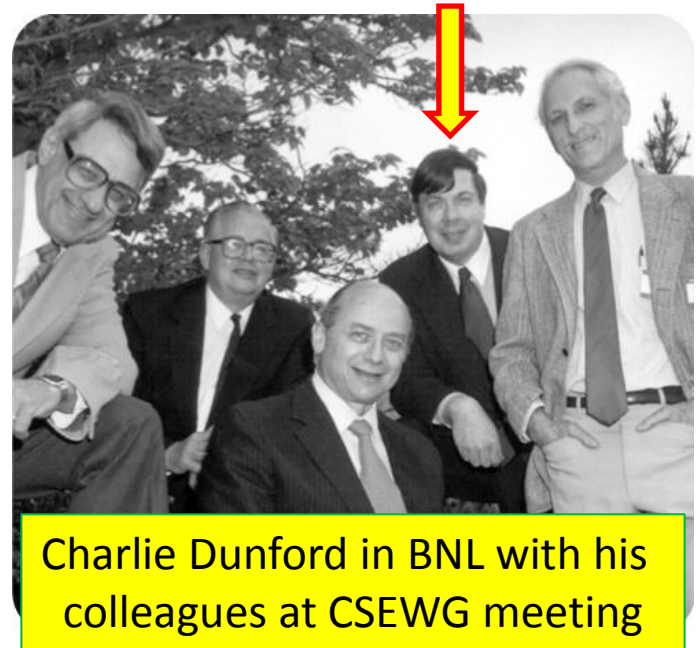
Domkirche St. Stephan zu Wien

# My first impressions from the IAEA

- My first impressions were shaped by my **background** and could be summarized as “*socialism with capitalistic salaries*”.
- Strictly **centralized organization**, something which I knew well from my own country - rigid planning, fixed budgeting, limited flexibility, somewhat relaxed working habits, complicated procedures, *etc.*
- On the other hand: **beautiful place**, nice people, incredible library, functioning system. My biggest problem was moral - accepting huge salary which exceeded my poor income in the Slovak Academy of Sciences by a nominal factor of 20 (in real terms around 5-10).
- Soon, however, the **drama** unfolded which overshadowed all these pleasant news.

# My career in NDS: 1993-2000

- My initial position was **informal**: Czechoslovakia ceased to exist in 1993, it took a while before Slovakia joined the IAEA and there was no one to provide governmental endorsement. %
- I officially became **Deputy Section Head** on 1 January 1994, major responsibility being nuclear data development.
- Served under two Section Heads: **Charlie Dunford** 1993-1995 and **Doug Muir** since 1996 (very different personalities, but very similar in one important aspect: both were generous and gave me a lot of freedom).
- **Acting Section Head** for 11 months (July 1995 – June 1996)
- Left IAEA on 30 March 2000 (next day reported to BNL and joined NNDC).



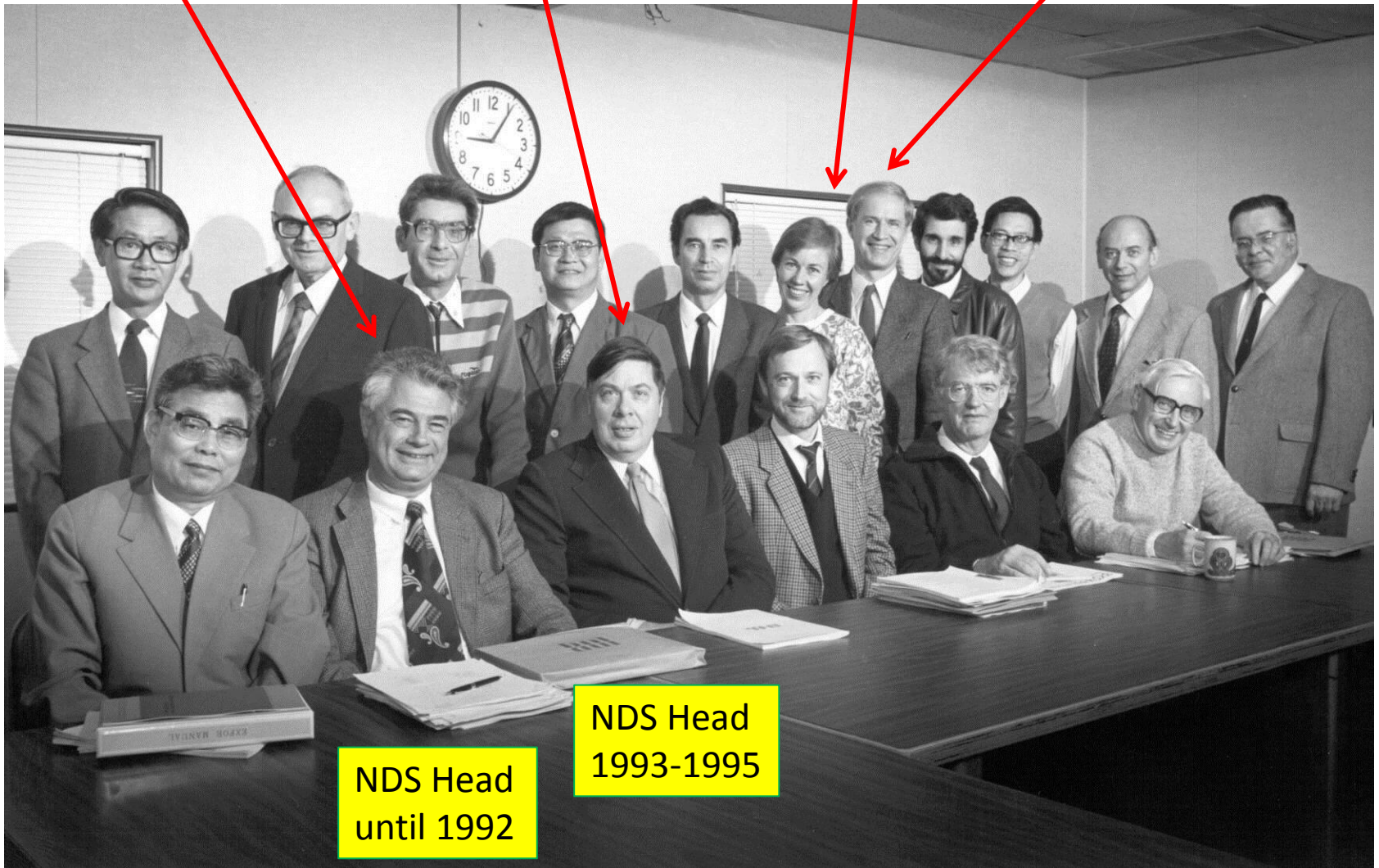
# NDS in transition into a new millennium

## *Early 1990s and three events that shaped it*

- 1. Fall of Iron Curtain and collapse of Communism.** These monumental events changed the world and had huge consequences. Support for nuclear physics and technology in two nuclear superpowers was suddenly questioned. Russia was tormented by drastic budgetary cuts, support in the USA went to decline as well.
- 2. Post-Chernobyl trauma.** Overall mood continued to be anti-nuclear, IAEA was under pressure and had to show due response. It targeted its most scientific program (G1 – Nuclear Data) as the one which might be reduced.
- 3. Leadership vacuum in NDS.** **Joe Schmidt**, long-term Section Head with deep inside IAEA know-how retired early 1992. His successor ought to be Prof. **Dieter Seeliger**, former GDR, but unified Germany blocked his nomination in the last minute. In addition, Deputy Section Head (**Doug Muir**) completed his term and returned to Los Alamos also in 1992.

# Historical photo: NRDC meeting in BNL, 1987

*Joe Schmidt, Charlie Dunford, Vicki McLane, Hans Lemmel*



## Charlie Dunford: Interim NDS Head

**Charlie Dunford** served as NDS Head from mid-July 1993 to 7 July 1995. He was on leave of absence from BNL for two years. His role was to provide much needed leadership to NDS until new search for Joe Schmidt successor was duly completed.

Things were **far from rosy** in the USA as well, in early 1990s the NNDC budget was cut drastically. Thus, Charlie fought on two fronts.

Before Charlie left he suggested me as **Acting Section Head**.



### INTERNATIONAL ATOMIC ENERGY AGENCY INTEROFFICE MEMORANDUM

TO: Mr. R.M. Iyer  
DIR-RIPC

DATE: 1995-05-08

OUR REF.:

FROM: Ch.L. Dunford, Head  
RIPC/Nuclear Data Section

YOUR REF.:

EXT NO.: 1709

SUBJECT: **Acting Section Head**

My last day of work at the Agency will be July 7. I wish to recommend that effective July 10, Mr. Pavel Obložinský be appointed Acting Head of the Nuclear Data Section until a permanent replacement is hired. Mr. Obložinský is the senior staff member of the NDS in rank (P-5) and has more than two years experience as Deputy Head of the Section. He has been regularly involved in the administration and policy matters of the Section and has shown excellent leadership qualities. I am certain that he will have the full support and cooperation of the Section.

I would also suggest that a replacement for me as your alternate on the CCC be appointed as soon as possible. Unfortunately I have no specific recommendation for this position.

cc: Ch.L. Dunford  
P. Obložinský  
File/RCS

Ch.L. Dunford/eb 1710

Memo by Charlie to Mr. Iyer, RIPC Director  
about his departure and Acting Section Head



# What happened in 1995

- Atmosphere surrounding NDS was tense. There were constant rumours about budgetary cuts and in-depth review, to be organized by the powerful **DG Office** (Mr. Tileman, head).
- **Charlie Dunford left** the IAEA on July 7 and returned to BNL. I became Acting Section Head (*Charlie to me before he left: Things are quiet, nothing can happen here during summer, ...*).
- One week after Charlie departure I was told that there will be in-depth **review** of NDS by high-ranking international panel.
- Prof. A. **Arima** (Japan) agreed to chair the panel in July, other high-ranking members were put together with unusual speed. Meeting was held at the end of summer.

# Who was Akito Arima

- **Prominent** nuclear physicist, best known as co-author of the interacting boson model (IBM) of collective nuclear states.
- **Chancellor** of Tokyo University 1989-1993; President of RIKEN 1993-1998; Minister of Education and Science, Japan 1998-1999.
- “Arima is **Mr. Science of Japan**” – Dick Meyer, new INDC chair in 1995.
- Arima chaired high-ranking IAEA Review Panel on Nuclear Data Section in 1995 (“**Arima Panel**”).



Akito Arima: Chancellor of Tokyo University, Director of RIKEN, Minister of Education and Science of Japan

# Arima Panel: Our Preparations

- After recovering from a shock I put all my energy and skills into preparations. My closest co-worker in NDS was **Hans Lemmel**. We consulted heavily with **Charlie Dunford**, he then talked to **Dick Meyer** (US DOE, formerly LLNL), new INDC chair since 1995. Many other friends were consulted as well.
- I felt that if we fail, then the nuclear data effort worldwide might be seriously damaged. There was **strong international coupling**: IAEA watched USA and once they went to cuts, IAEA would question the wisdom of its own support; USA watched IAEA...; Russia watched USA..., etc.
- Our effort focused on 3 directions:
  1. Bring Charlie and Dick to the Panel meeting as consultants
  2. Communicate our part of the story to each member of the Panel
  3. Make a case for the Panel about importance of the Nuclear Data Program for the IAEA Member States

# Arima Panel: Meeting and Outcome

**Panel met** at the end of August 1995. Charlie Dunford and Dick Meyer attended as consultants. Dick and Arima knew each other well - Arima was prominent nuclear structure theorist, Dick prominent nuclear structure experimentalist (100 papers in Phys. Rev. C).

Outcome was **highly positive** to NDS! Arima appeared to be enlightened leader, preferred long-term views and felt strongly that nuclear science and technology need to be duly supported. One-page summary put NDS into delight. NDS situation stabilized, transition into a new millennium become possible.

*Some stories (off-record only): how Arima talked to Dick, what happened at the meeting, how full report was acknowledged,*

...



With Dick Meyer and his wife Ruth in Cape Cod, Massachusetts, 2001

# NDS – Into a new millennium

Challenges: computerization, evaluation tools, non-energy data

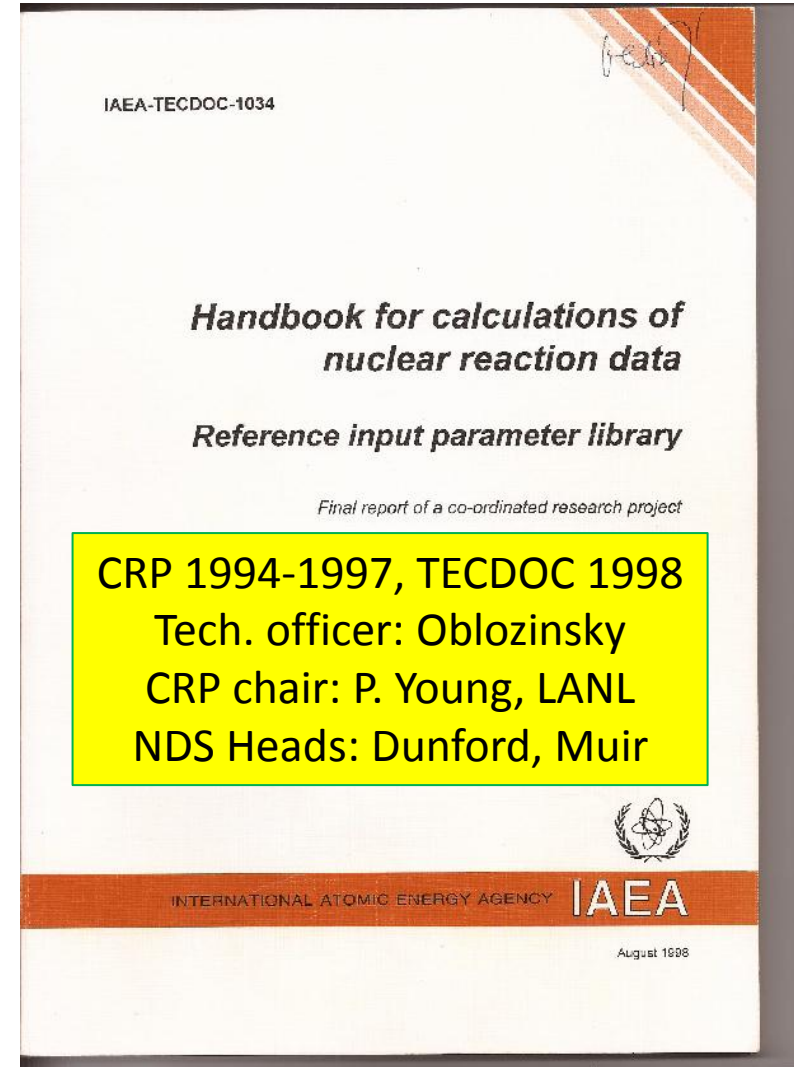
In the middle of 1990-ies Nuclear Data Section played important role in data compilation (EXFOR library), coordination (NRDC and NSDD networks) and classical services (paper, tapes). However, it suffered from **poor computerization** and lacked capabilities in nuclear reaction data **evaluations**. Due to strong pressure to avoid duplication with NEA Paris, IAEA restricted its nuclear data activities to **non-energy** applications.

- Charlie emphasized **computerization** and brought powerful DEC Alpha into NDS operations. This allowed much better data exchange with US National Nuclear Data Center and was big step towards future electronic services.
- I used my strong academic background in nuclear reaction modelling and initiated development of **evaluation tools**. This was big step towards future evaluations, currently representing very strong element in NDS capabilities.
- Initiated were several projects on data for **non-energy** applications such as photonuclear, cross sections for radiosotope production and  $\gamma$ -ray standards.

# Into a new millennium: Input parameter library for nuclear model calculations

## Reference Input Parameter Library, RIPL

- Unique achievement, not possible without exceptional **role** of the IAEA in organizing international projects
- In early 90-ies preparation of input for nuclear reaction model codes took **weeks**. Thanks to RIPL, today this is virtually automatic.
- RIPL was discussed in number of meetings, I pushed for sequential **strategy** which was adopted and implemented.
- CRP on **RIPL-1** started in 1994, RIPL-2 and RIPL-3 followed (3 technical officers – Oblozinsky, Herman, Capote, 3 NDS heads).



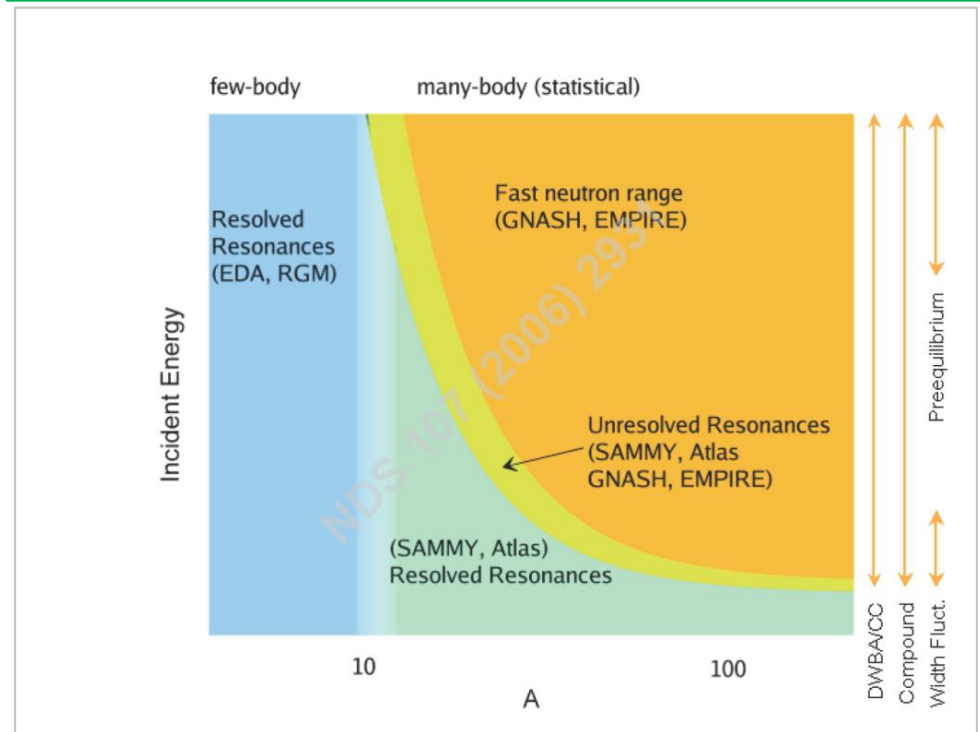
# Into a new millennium:

## EMPIRE - tool for nuclear reaction data evaluation

### Nuclear reaction model code EMPIRE

- I brought **Mike Herman** to NDS in 1997, P-4 position in Nuclear Data Development Unit.
- Mike brought with him the code **EMPIRE**, originally developed in Warsaw (1980), later in Bologna.
- The code was made open, international **developer team** was established, and huge improvements were made.
- Since 2000 EMPIRE serves as **basic tool** for nuclear reaction data *evaluations*, heavily used by the IAEA, BNL and other groups.

### Evaluation is cream of nuclear data business



EMPIRE reflects incredible complexities of nuclear reaction physics and covers extensive range of masses and energies

# Concluding Remarks

I witnessed and helped to shape **transition** of the IAEA Nuclear Data Section during 1993-2000 into a **new millennium**. This process was not simple and it was not without dramatic moments.

The fact that we are here today and celebrate **50 years** of NDS is evidence that the IAEA Nuclear Data Program has firm foundation and is viewed positively by the **IAEA Member States**.

I am convinced that NDS is on good way to keep nuclear data flag high. Let me wish the IAEA Nuclear Data Program ***lots of good data in many years to come!***