Hans Feldmeier and some personal recollections on the occasion of his 70th birthday

1948 May 31, born in Rothenkirchen, Germany

1966 Begin of study in mathematics and physics at TH Darmstadt

1971 Diploma in physics
Thesis: "Influence of non-central forces on the spectrum of ^{24}Mg"

1974 Dr. rer. nat.
Thesis: "Effective interactions for nuclei at the beginning of the sd-shell"

Effektive Wechselwirkungen für Kerne der sd-Schale

M. Conze, H. Feldmeier, P. Manakos, T. Wolff (Inst. f. Kernphysik Technische Hochschule Darmstadt)

Bei Schalenmodellrechnungen im $(sd)^n$ -Konfigurationsraum erhält man für Kerne am Anfang der sd-Schale mit den von T. T. S. Kuo und G. E. Brown hergeleiteten effektiven Wechselwirkungen im wesentlichen eine gute Reproduktion der experimentellen Daten. Bei Kernen, die ein niedrigliegendes zweites Rotationsband aufweisen, (ab Massenzahl A=21) zeigt sich jedoch ein signifikantes Abweichen der berechneten von den experimentellen Spektren. Das angeregte Rotationsband liegt in allen Fällen zu tief, während die Niveauabstände innerhalb der Bänder richtig beschrieben werden. Es zeigt sich, daß durch Variation eines speziellen nichtzentralen Anteils, des ALS-Teils, der effektiven Wechselwirkung dieser Mangel behoben werden kann. Unter Berücksichtigung dieses ALS-Teils läßt sich durch Anpassung an experimentelle Daten eine effektive Wechselwirkung finden, die nicht nur die Lage der Rotationsbänder richtig beschreibt, sondern auch die Energiespektren und übrigen Observablen für Kerne in der ersten Hälfte der sd-Schale insgesamt wesentlich besser reproduziert.

Spring Meeting - NP Division of the DPG Bochum 1974

1948	May 31, born in Rothenkirchen, Germany
1966	Begin of study in mathematics and physics at TH Darmstadt
1971	Diploma in physics: Thesis: "Influence of non-central forces on the spectrum of ^{24}Mg"
1974	Dr. rer. nat. Thesis: "Effective interactions for nuclei at the beginning of the sd-shell"
1975	Postdoc at Oak Ridge National Laboratory, U.S.A.
1976	Research Associate at Institut für Kernphysik, TH Darmstadt
1978–2017	Co-organizer of the International Hirschegg Workshops on "Gross Properties of Nuclei and Nuclear Excitations"
1981	Habilitation Thesis: "Interacting fermion systems of small particle numbers"
1981–1986	Heisenberg fellow at MPI Heidelberg/TU and GSI Darmstadt
1986–2013	Staff scientist at GSI
1990	Professorship at TH (now TU) Darmstadt
2009–2013	Head of the Theory Group "Nuclear Structure and Nuclear Astrophysics" at GSI

Hans Feldmeier´s Fields of Research

- Theoretical Nuclear Physics
  – Nuclear structure
    Short range correlations in nuclei
  – Nuclear reactions

- Nuclear Astrophysics

- Dissipative Phenomena in Quantum Mechanics

- Cold Fermions in Traps

→ Some selected examples

Research activities

- SU(3) Shell model and effective interactions

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Allowed β-Transitions, Weak Magnetism and Nuclear Structure in Light Nuclei*

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AND

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Nuclear Physics **A295** (1978) 319–332;

STUDY OF ELECTRIC MONOPOLE TRANSITIONS BETWEEN THE GROUND STATE AND THE FIRST EXCITED 0^+ STATE IN ^{40,42,44,48}Ca WITH HIGH RESOLUTION INELASTIC ELECTRON SCATTERING †

H. D. GRÄF, H. FELDMEIER, P. MANAKOS, A. RICHTER and E. SPAMER

Institut für Kernphysik, Technische Hochschule Darmstadt, 6100 Darmstadt, Germany

and

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Research activities

- SU(3) Shell model and effective interactions
- TDHF → Dissipation in small isolated Fermi systems → Dissipative HI collisions

PHYSICAL REVIEW C VOLUME 15, NUMBER 4 APRIL 1977

Time-dependent Hartree-Fock calculations for $^{16}O + {}^{16}O$ and $^{40}Ca + {}^{40}Ca$ reactions*

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(Received 20 September 1976)

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Nuclear Physics **A332** (1979) 455–476;

STRONGLY DAMPED COLLISIONS IN THE $^{40}Ar+^{40}Ca$ SYSTEM

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1979

Z. Phys. A - Atoms and Nuclei 302, 365 – 366 (1981)

Zeitschrift für Physik A Atoms and Nuclei

Short Note

Comment on Fusion Cross Sections in the $^{40}Ar + ^{40}Ca$ and $^{40}Ca + ^{40}Ca$ Systems*

J. Carter, H. Feldmeier, A. Richter, G. Schrieder, and P. Wastyn

Institut für Kernphysik, Technische Hochschule Darmstadt, D-6100 Darmstadt, Federal Pepublic of Germany

Z. Phys. A – Atoms and Nuclei 313, 57–67 (1983)

Zeitschrift für Physik A Atoms and Nuclei

On the Fusion Dynamics of $^{40}Ar + ^{40}Ca$ – Fusion-Fission and Fusion-Evaporation*

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Research activities

- SU(3) Shell model and effective interactions
- TDHF → Dissipation in small isolated Fermi systems → Dissipative HI collisions
- Short range repulsion between nucleons, Unitary Correlation Operator Method (UCOM), applications to nuclear structure and reactions, dynamics is treated by the method of Fermionic Molecular Dynamics (FMD)

ELSEVIER

Nuclear Physics A 632 (1998) 61–95

NUCLEAR PHYSICS A

A unitary correlation operator method

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Molecular dynamics for fermions

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The time-dependent variational principle for many-body trial states is used to discuss the relation between the approaches of different molecular-dynamics models that describe indistinguishable fermions. Early attempts to include effects of the Pauli principle by means of nonlocal potentials, as well as more recent models that work with antisymmetrized many-body states, are reviewed under these premises.

Reviews of Modern Physics, Vol. 72, No. 3, July 2000 0034-6861/2000/72(3)/655(34)/$21.80

2000

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Research activities

- SU(3) Shell model and effective interactions
- TDHF → Dissipation in small isolated Fermi systems → Dissipative HI collisions
- Short range repulsion between nucleons, Unitary Correlation Operator Method (UCOM), applications to nuclear structure and reactions, dynamics is treated by the method of Fermionic Molecular Dynamics (FMD)
- Nuclear astrophysics

PRL 98, 032501 (2007) PHYSICAL REVIEW LETTERS week ending 19 JANUARY 2007

Structure of the Hoyle State in ^{12}C

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PRL 105, 022501 (2010) PHYSICAL REVIEW LETTERS week ending 9 JULY 2010

Pair Decay Width of the Hoyle State and its Role for Stellar Carbon Production

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Review

Towards microscopic ab initio calculations of astrophysical *S*-factors

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Hearthy congratulations and all the best for you and your growing family in the years to come!