

## CURRICULUM VITAE

Name : HEENEN, Paul-Henri  
 Date and place of birth : 03 December 1947 Brussels  
 Nationality : Belgian

### I. CAREER HISTORY

#### A. Degrees Attained

- Diploma in Physics Engineer (1970 - Université Libre de Bruxelles)
- PhD in Physics (1975 - Université Libre de Bruxelles)  
 (title : A quantal description of collisions between heavy ions)
- Agrégé de l'enseignement supérieur (1985 - Université Libre de Bruxelles)  
 (title : The Hartree-Fock method on a mesh: applications to nuclear spectroscopy)

#### B. Employment History

- Research assistant at the Institut Interuniversitaire des Sciences Nucléaires (01/10/70 to 30/09/76)
- Senior research assistant at the Institut Interuniversitaire des Sciences Nucléaires (01/10/76 to 30/09/79)
- Research Associate at the Fonds National de la Recherche Scientifique (01/10/79 to 30/09/85)
- Senior Research Associate at the Fonds National de la Recherche Scientifique (01/10/85 to 30/09/89)
- Research Director of the Fonds National de la Recherche Scientifique (01/10/89 to 31/12/98)
- Ordinary Professor at the Free University of Brussels (since 01/01/99)

My research activities are performed in the department of nuclear physics of the University of Brussels.  
 (military duties from 01/03/76 to 31/12/76)

#### C. Long term stays outside Brussels

- Division de Physique Théorique de l'Institut de Physique Nucléaire d'Orsay (France) : 01/10/78 to 30/06/79
- Lawrence Berkeley Laboratory (Berkeley, California): 15/06/80 - 30/08/80
- Lawrence Livermore National Laboratory (Livermore, California): one to two months stays in 1982, 1984, 1986, 1989, 1991, 1992, 1993, 1994 and 1997.
- Institute for Nuclear Theory (University of Washington, Seattle) , October 1995, May 2002, 2004, 2005, 2008 and 2009.
- Physics Division of the Argonne National Laboratory (Illinois), July 2008.

#### D. Prizes and awards

- Prix Guillissen 1978 (Université Libre de Bruxelles)
- Lauréat du Concours des Bourses de voyage 1979 (Belgian Ministry for education)
- Prix IBM Belgium d'Informatique 1985
- Lauréat du Concours Annuel 1988 of the Sciences Division of the Belgian Royal Academy.

- Prix A. Wetrems 1991-1992 of the Sciences Division of the Belgian Royal Academy.
- Fellow of the American Physical Society since november 1997, with the citation:  
" For his many contributions to our understanding of the nuclear mean-field, especially for the development of self-consistent methods to study the static and dynamic aspects of nuclear motion."
- Member of the Académie Royale de Belgique ( Classe des Sciences) since 1999 and of the Comité National de Physique since 2005. Actually vice director of the Classe des Sciences.
- Selected in 2009 as "Outstanding Referee" by the American Physical Society.

## II. RESEARCH ACTIVITIES

### A. Domain

- Theoretical physics
- Main domain: Low energy nuclear physics
- Secondary domains: atomic and molecular physics, large scale scientific computing

### B. Publications

- total number of publications: around 250
- articles in refereed journals: 133 (average citation index, 35.5)
- h-factor 37 (Isiknowledge June 2011)
- coeditor of the Proceedings of the workshop on "Nuclear structure and nuclear shapes at low excitation energies", Cargèse, France (June 1991), Plenum Press Vol.289 and of the workshop on "Nuclear structure and nuclear shapes at low excitation energies", Antibes, France (June 1994), Editions Frontières.

### C. Conferences and seminars

- invited talks to conferences: around 80
- communications to international meetings: around 75
- Conferences and seminars in Belgium : around 35, outside Belgium : around 125 (including an invited talk at the general meeting of the APS, April 1995)

### D. Collaborations

- close collaborations since 1978, with H. Flocard (Orsay) and P. Bonche (Saclay until 2006) and since 2001 with M. Bender (Bordeaux),
- long term collaborations with physicists from Livermore, Orsay, Lyon, Warsaw, Kyoto, Debrecen, Stockholm, Oak Ridge, Argonne and Seattle, some of them being still active.
- collaborations with experimentalists of Leuven, Orsay, Saclay, Ganil, Jyväskylä, Liverpool and Argonne which have each time resulted in common publications.

### E. Committees and Journals

- consultant at the Lawrence Livermore National Laboratory from 1989 to 1997.
- member of the Scientific Committee of the International School of Nuclear Physics Joliot Curie from 1988 to 2006.
- member of the scientific Nuclear and Particle Physics Commission of the IISN-FNRS (Belgium) from 1992 to 1999.
- member of the Scientific Committee of the Ganil accelerator (2000-2003) (France)
- member of the ISOLDE committee at CERN (since 2008).
- member of the FWO-V commission E5 from 1992 to 1995 and since 2007.
- nominated in September 2004 by the ESF as a member of the “Nuclear Physics European Collaboration Committee (NUPECC)”
- member of the steering committee (six members) in charge of organizing the new long range plan for nuclear physics in Europe and of writing the final version.
- chairman of the editorial board of Nuclear Physics News International (since 2005).
- Associate Editor of the APS journal Physical Review Letters for nuclear physics from 2005 to 2007.
- member of the editorial board of the IOP publication Report on Progress in Physics (since 2008).
- advisory editor for scholarpedia
- regular referee for Nature and for the main nuclear physics journals
- referee for different national research organizations (France, UK, USA, Finland, Croatia, Canada).
- member of the organizing committees or of the international advisory of many conferences organized outside Belgium.

Among the meetings that I have organized in Belgium with a large international participation, let us note a one day seminar “Topics in Supercomputer” : The use of supercomputers in ab initio calculations for nuclei, atoms and molecules (Bruxelles 02/12/91) and a 3 day workshop: “Static and Dynamics Mean-field Approaches: from Nuclei to Molecules” (Bruxelles, 25 to 27 April 1996).

### F. Grants

The group in which I am working has grants from the Institut Interuniversitaire des Sciences nucléaires, the ministry of Scientific Policy and from the European Community. I have also obtained a special grant from this ministry for a collaboration with atomic and molecular physicists. I have received NATO Grants for International Collaboration in Research from march 1985 to June 90 for my Livermore - Orsay - Saclay collaboration and from 1997-1999 for my collaboration with Orsay-Ganil Argonne and Oak Ridge.

I am presently the spoke person for the joint research activity on theory of the proposal submitted to the European commission to support the main infrastructure in low energy nuclear physics.

### III. TEACHING DUTIES

From 89 to 92, I have given a series of lectures on “Introduction aux superordinateurs et à leurs applications” , at the University of Brussels and in 1990 at the University of Louvain la Neuve.

In 91 and 92, I have given a series of lectures to students in last year in physics on: Le noyau atomique, un système quantique multiforme.

I have given various lectures to graduate students (third cycle) in Belgium and in other countries.

As a full professor, I am presently giving several courses of physics to undergraduate students at the ULB. I am also giving lectures in the first year of the master degree at the Catholic University of Leuven on nuclear structure models.

#### IV. ADMINISTRATIVE FUNCTIONS

I have been member of numerous commissions at the University of Brussels. Among others

- member of the Research Council of the University from 1982 to 1987 and
- member of the Board of Administration of the University in 1985 and 1986.
- chairman of the User's Committee of the Brussels Computing Center from 1987 to 1997.
- chairman of the Physics Department of the University in 1998 and 1999.
- chairman of the board of the ULB-VUB computer center from 2003-2007.
- present chairman of the "commission de l'enseignement" of the ULB physics department.

#### V. FIVE MOST REPRESENTATIVE PUBLICATIONS

P. Bonche, H. Flocard, P.-H. Heenen, S.J. Krieger and M.S. Weiss

Self-consistent study of triaxial deformations : Application to the isotopes of Kr, Sr, Zr and Mo  
Nucl. Phys. **A443** (1985) 39-63 (300 citations)

This paper is the first systematic application to a large set of nuclei of the method that I have developed with H. Flocard during a post doctoral stay in Orsay in 1978-9. The numerical code that we have written was at the limit of the computational facilities at that time. This study of series of isotopes whose shape is rapidly changing with the neutron number is still often cited.

J. Terasaki, P-H Heenen, P. Bonche, J. Dobaczewski and H. Flocard

Superdeformed rotational bands with density dependent pairing interactions  
Nucl Phys **A593** (1995) 1-20. (98 citations)

This paper is one of the most successful application that we have performed to study the phenomenon of super-deformation which was actively studied experimentally.

M. Bender, P.-H. Heenen, and P.-G. Reinhard

Self-consistent mean-field models for nuclear structure  
Rev. Mod. Phys **75** (2003) 121-180 (557 citations)

This paper makes a review of the main development in mean-field methods for nuclear structure theory and fills a gap after the last book written on the subject by Ring and Schuck in 1980.

S. Ćwiok, P.-H. Heenen and W. Nazarewicz

Shape coexistence and triaxiality in Superheavy Nuclei  
Nature, **433**, 705-9 (2005) (65 citations)

The most recent paper that we have published on the subject of super-heavy nuclei, where we have shown that the predictions of fully self consistent methods can differ significantly from semi microscopic models.

M. Bender, G. Bertsch and P.-H. Heenen,

Global study of quadrupole correlation effects  
Phys. Rev. **C 73** 034322 1-26 (2006) (59 citations)

This study of the ground state properties of the 600 even-even nuclei for which the binding energy has been determined experimentally has permitted a systematic study of the correlations that should be included beyond a mean-field approach.