



DEPARTMENT OF PHYSICAL SCIENCES  
NMR Research Group  
Prof. Jukka Jokisaari

## CURRICULUM VITAE

**Full names** Jokisaari, Jukka Paavo  
**Date and place of birth** 29.02.1944, Kemi  
**Nationality** Finnish  
**Marital status** Married

### Address

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### Education and training

Candidate of Philosophy, physics, University of Oulu	20.05.1968
Licenciate of Philosophy, physics, University of Oulu	15.10.1970
Doctor of Philosophy, University of Oulu	14.11.1974

### Present position

Professor, Department of Physical Sciences, University of Oulu	01.02.1987 -
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### Fields of research

Nuclear magnetic resonance spectroscopy of

- noble gases dissolved in liquid crystals, liquid-crystalline polymers and polymers (noble gas NMR is used for the study of physicochemical properties of the materials)
- xenon dissolved in liquids and confined in mesoporous materials (investigation of pore size and pore size distribution)
- xenon gas adsorbed in nanoporous materials (properties of aluminophosphate and silicoaluminophosphate molecules sieves)
- laser-polarized (hyperpolarized)  $^{129}\text{Xe}$  gas and its application to materials research
- solute molecules in liquid crystals (structure, shielding tensors, spin-spin coupling tensors, quadrupole coupling tensors of solute molecules)
- isotropic liquids (in particular, determination of the anisotropy of nuclear shielding tensors through relaxation time measurements)
- solid mercury compounds (determination of nuclear shielding and spin-spin coupling tensors)

### Research awards, honours and major grants

- Senior researcher's grant		01.01.1981 - 30.06.1981
Academy of Finland		01.07.1989 - 30.06.1990
		01.08.1995 - 31.07.1996
		01.08.2001 – 31.07.2002
- Research grants		
Academy of Finland	524 000 €	1999 - 2006
Neste Oy Foundation	58 000 €	1999 - 2002

### Memberships in scientific societies

- EIC (European Experimental NMR Conference / International Committee): Vice president 1994 - 1996, Chair-elect 1996 – 1998, Chairman 1998- 2000, Past- Chairman 2000-2002, Member 2002- 2005 (The committee consisted of 20 members from various European countries. I was the only Finn.)
- AMPERE Committee, member, 1994 – (There are 43 members in the committee from practically all the European countries. I am the only Finn.)
- Finnish Physical Society, member
- Finnish Chemical Society, member

### Other academic and professional merits and activities

- Head of the Department of Physical Sciences, 1.8.1998 -
- "Good Teacher's Award", Faculty of Science, University of Oulu, 1992
- Post-doctoral research fellow at the Department of Physics, University of Basel, Switzerland, 1978-9 (13 months), 1981-2 (15 months), and 1989-90 (12 months)
- Visiting professor at the Department of Physics, University of Basel, Switzerland, 1994-5 (3 months)
- Member of the Study Panel on Analytical Large-Scale Facilities by EU Commission, 1994-5
- *Acta Universitatis Ouluensis, Scientiae rerum naturalium*, editor, 1999-2001
- Annual Meeting of the Finnish Physical Society, chairman of the programme committee 1991
- Annual Meeting of the Finnish Physical Society, chairman of the organizing committee and member of the program committee, 2004
- Chairman of the Organizing Committee of the 12th European Experimental NMR Conference, Oulu, July 5-10, 1994. (ca. 500 participants from 30 countries)

### Review activities

(a) In journals (several times in most of them):

*Acta Chemica Scandinavica, Analyst, Applied Magnetic Resonance, Canadian Journal of Chemistry, Chemical Communications, ChemPhysChem, Chemical Physics Letters, Chemistry-A European Journal, Croatica Chemica Acta, European Journal of Organic Chemistry, Journal of American Chemical Society, Journal of the Chemical Society Faraday Transactions, Journal of Chemical Physics, Journal of the Chemical Society Perkin Transactions, Journal of Magnetic Resonance, Journal of Materials Chemistry, Journal of Molecular Structure, Journal of Physical Chemistry, Journal of Physics B, Liquid Crystals, Magnetic Resonance in Chemistry, Microporous and Mesoporous Materials, Molecular Physics, Physical Chemistry Chemical Physics*

(b) In science foundations:

*International Science Foundation (ISF) /USA, National Science Foundation (NSF)/USA, Academy of Finland/Committee of Natural and Technical Sciences, Estonian Science Foundation (Eesti Teadusfond), Suomen Kulttuurirahasto/Pohjois-Pohjanmaan Rahasto (Finnish Cultural Foundation).*

(c) In seven Ph.D. theses in physics and chemistry.

### **Publication activities**

- **146** articles in referee journals (see the list of publications)
- **258** conference abstracts (list not enclosed)

### **Supervisor** of the following **9** Ph.D. Theses:

*Räisänen, Kauko*, "Multinuclear studies on molecular structure and anisotropy of spin-spin coupling constant, 1980

*Lounila, Juhani*, "Investigations of the effects of the anisotropic forces on the NMR parameters of partially oriented molecules", 1984

*Väänänen, Taito*, "NMR investigations on the structure and orientation of small molecules in liquid crystals", 1987

*Hiltunen, Yrjö*, "Studies on the determination of the NMR parameters of partially oriented molecules", 1988

*Ala-Korpela, Mika*, "Application of  $^1\text{H}$  NMR spectroscopy to human blood plasma and lipoprotein research", 1994

*Korhonen, Ari*, "Development and application of  $^1\text{H}$  NMR methodology to lipoprotein analysis", 1998

*Ylihautala, Mika*, "NMR of small solutes in liquid crystals and molecular sieves", 1999.

*Kaski, Jaakko*, "Experimental determination of spin-spin coupling tensors applying NMR of partially oriented molecules", 1999.

*Koskela, Tuomas*, "Investigations of aluminophosphate molecular sieves applying noble gas and methane NMR spectroscopy", 2004.

Supervisor of **6 Ph. D. theses in progress** (in parantheses is given estimated year for Ph.D. degree): *M. Sc. Anu Kantola (2006)*, *M.Sc. Susanna Ahola (2006)*, *M.Sc. Anja Pulkkinen (2006)*, *M.Sc. Jani Saunavaara (2007)*, *M.Sc. Ville- Veikko Telkki (2006)*, and *M.Sc. Pekka Tallavaara (2008)*.

Moreover, **4** other Ph.D. theses were completed in my group. I was involved in all of them, although not as a main supervisor. Thus, in all **13 Ph.D. theses** have been done in the NMR Research Group during the time I have been leading it.

### **Recent invited lectures**

*J. Jokisaari*, " $^{129}\text{Xe}$  relaxation and diffusion in isotropic and anisotropic liquids", 8<sup>th</sup> Chianti Workshop on Magnetic Resonance. Nuclear and electron relaxation, San Miniato (Pisa), Italy, 30.5.-5.6.1999.

*J. Jokisaari*, "NMR of Noble Gases in Liquid Crystals", A British Liquid Crystal Society Conference, University of Southampton, UK, August 23-24, 1999.

*J. Jokisaari*, "Determination of structure, and nuclear shielding and spin-spin coupling tensors for molecules partially oriented in liquid crystalline environments", Nordic NMR Symposium, Gothenburg, Sweden, August 23-25, 1999.

*J. Jokisaari*, "Xenon NMR in Liquid Crystals", XEMAT2000 Optical Polarization and Xenon NMR of Materials, Sestri Levante, Italy, June 28-30, 2000.

- J. Jokisaari, A. Kantola, J. Kaski, P. Lantto and J. Vaara, "Spin-spin coupling and shielding tensors as determined by liquid crystal NMR and computation", 15<sup>th</sup> European Experimental NMR Conference (EENC 2000), Leipzig, Germany, June 12-17, 2000.*
- J. Jokisaari, "Experimental determination of NMR tensors utilizing LCNMR spectroscopy and comparison of results with the computed ones", Finnish Symposium on Quantum Chemistry. An International Conference in Honor of Professor Pekka Pyykkö. Kuusamo, Finland, June 11-17, 2001.*
- J. Jokisaari, "NMR of noble gases dissolved in liquid crystals", Invited talk in: CSC2002, Vancouver, Canada, June 1-5, 2002.*

## Teaching experience

I have lectured the following courses (many of them several times):

- Approbatur I and II (basic courses in physics)
- Mechanics (basic course)
- Thermodynamics (basic course)
- Electricity and magnetism (basic course)
- Physical measurements I (basic course)
- Atomic and nuclear physics (basic course)
- Wave motion (basic course)
- Optics and atomic physics (basic course for students in Technical Faculty)
- Introduction to physics (basic course for students in the Faculty of Science, except physics students)
- Biophysical NMR (introduction to NMR for biophysics students)
- NMR of Biomacromolecules / Basic principles of 1-dimensional NMR spectroscopy (in Oulu School of Biotechnology)
- Thermodynamics and statistical physics (*cum laude* course)
- Electricity (*cum laude* course)
- Wave motion and optics (*cum laude* course)
- Optics (*cum laude* course)
- Atomic physics (*cum laude* course)
- Solid state physics (part of the *cum laude* course Solid state physics, atomic and nuclear physics)
- Programming in FORTRAN (*laudatur* course)
- Quantum mechanics (*laudatur* course)
- Molecular physics (*laudatur* course)
- Applications of quantum mechanics (*laudatur* course)
- Molecular force fields (*laudatur* course)
- NMR spectroscopy (*laudatur* course)
- NMR spectroscopy of heavy nuclei (*laudatur* course)
- NMR imaging (*laudatur* course, together with J. Lounila)
- Fourier transformation and its applications (*laudatur* course)
- Essey and seminar (*laudatur* course)

In 1992, I received a “**Good Teacher’s Award**” from the University of Oulu. One teacher from each faculty was awarded.

Jukka Jokisaari