

# Curriculum Vitæ – Henry Edward Fischer

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Birth: 19 August 1962 in Rolla, Missouri, USA      Family situation: married, no children  
Nationalities: French (naturalized 17 Sept 1999), American

## EDUCATION

**DHDR** Université Joseph Fourier (Grenoble I), Physique, Dec 1997

Président du jury: Dr. Denis Raoux

**Ph.D.** Cornell University, Solid-State Physics, Jan 1990

Thesis title: Thermal transport in solids – diffusive and radiative regimes

Thesis director: Prof. Robert O. Pohl

**M.Sc.** Cornell University, Physics, Jan 1988

**B.Sc.** Purdue University, Physics and Mathematics (summa cum laude), May 1984

## SCIENTIFIC EMPLOYMENT AND RESEARCH ACTIVITIES

since 4/04: (ILL, Grenoble). *D4 (and also D20 until 12/09) instrument responsible, 9/17 – 9/23: also Head of the ILL Graduate School (IGS).*

- Structure of liquids and glasses using neutron diffraction.
- PDF-analysis (atomic structure of disordered crystal or nano-structured systems).
- Magnetic PDF-analysis (structure of static and dynamic spin-spin correlations).
- Diffraction under extreme conditions (T,P).
- Neutron scattering length measurements (interferometry and NPD).
- Quantum effects in the structure of water.
- Critical scattering in magnetic liquids (SANS).
- Development of data-analysis software (C, Fortran) for D4.
- Contributed substantially to Radial Oscillating Collimator (ROC) project for D20.
- Formerly engaged in the Dracula diffractometer project.

9/99 – 3/04: (LURE, Univ. Paris-Sud, Orsay). *Professeur des Universités (28ème CNU).*

- Structure and dynamics of liquids and glasses using x-ray and neutron scattering.
- Full-time teaching load (Département de Physique).

8/94 – 8/99: (ILL, Grenoble). *D4 instrument responsible.*

- Structure of liquids and glasses using neutron scattering.
- Glassy dynamics in glasses and disordered crystals (*e.g.* ethanol).
- Development of data-reduction (C) software for D4.
- Head of the D4c instrument project.

10/92 – 7/94: (LURE, Orsay). *Postdoctoral researcher (Chateaubriand fellow)*.

- Structure (including interfacial) of multilayers using synchrotron x-ray diffraction.
- Software development (C) for off-specular x-ray diffraction from multilayers (DWBA).
- Giant magnetoresistance (GMR) in magnetic superlattices (Fe/Cr and MnFe/Ir).

2/90 – 9/92: (McGill Univ., Montréal). *Postdoctoral researcher for Prof. Mark Sutton*.

- Real-time synchrotron x-ray diffraction of rapid crystallization in metallic glasses.
- Weak localization (coherent backscattering of  $e^-$ ) in metallic glasses at very low temperature for systems having low and tunable spin-orbit coupling.

9/84 – 1/90: (Cornell Univ., Ithaca). *Thesis student (advisor: Prof. Robert O. Pohl)*.

- Low-temperature specific heat of “heavy fermion” systems.
- Thermal properties at high-temperature measured with a heat-pulse technique.
- Low-temperature properties of high- $T_c$  superconductors.
- Thermal conductance at very low-temperature (50 mK) in silicon monocrystals.
- Developed Monte Carlo simulations (Fortran) of phonon blackbody radiation including the effects of surface scattering and “phonon focusing”.
- Developed instrument control software (Quick Basic) for thermal conductivity measurements in a dilution refrigerator.

summer 1983: (Yale Univ., New Haven). *Research assistant for Prof. Robert Apfel*.

- Experiments on acoustic levitation of oil droplets in water, towards possible applications in tertiary oil recovery.

9/80 – 6/81: (Purdue Univ., West Lafayette). *Research assistant for Prof. Peter S. Rosen*.

- Developed software (Pascal) for an application to neutrino oscillation experiments.

summers 1980–82: (LNL Insurance Corp., Fort Wayne). *Computer programmer for R&D*.

- Contributed to development of “office automation” software (Fortran, Basic).

## ACADEMIC DISTINCTIONS DURING UNIVERSITY STUDIES

*Cornell University* (1984–1989)

Office of Naval Research (ONR) Graduate Fellowship (1984–1987)

*Purdue University* (1980–1984)

Dobro Slovo (National Slavic Honor Society) (spring 1984)

Score of 9/120 (median was 0) in the 1983 USA Putnam Math Competition

Golden Key National Honor Society Scholarship (autumn 1983)

Phi Beta Kappa (spring 1983) and Phi Kappa Phi (spring 1983)

Purdue President’s Honor Award (autumn 1980)

# Teaching Experience

## TEACHING EXPERIENCE AT UNIVERSITÉ PARIS-SUD (PARIS-XI)

years 03/04 and 02/03: Same duties as in 01/02, being 184 hrs éq. TD in total.

year 01/02: Lectures, recitations and lab practicals in cristallography/diffraction (4th-year honors physics) (C: 22.5 hrs, TD: 22.5 hrs, TP: 48 hrs); Physics lectures for 1st- and 2nd-year medicine (PCEM) – the same duties and responsibilities as in 2000/01 (C: 58 hrs); Tutor for a thesis student (éq. TD: 5 hrs).

spring 01: Lectures and recitations in mechanics for 3rd-year Physical Sciences (C: 9 hrs, TD: 14 hrs); Physics lab practicals for 3rd-year electronics (EEA) (TP: 38.5 hrs); Tutor for a thesis student (éq. TD: 5 hrs).

autumn 00: Physics lectures for 1st- and 2nd-year medicine (PCEM) (C: 58 hrs) – mechanics, hydrodynamics and waves – as responsible for the physics teaching of 440 students in PCEM, my duties include coordination of a team of 8 teaching assistants (maîtres de conférence) for the recitations, composition of exams, budget overseeing (for lab practicals, etc), and participating in inter-disciplinary meetings concerning pedagogy and exams; Physics lab practicals for 3rd-year electronics (EEA) (TP: 24.5 hrs).

spring 00: Lectures and recitations in mechanics for 3rd-year Physical Sciences (C: 9 hrs, TD: 14 hrs); Physics lab practicals for 3rd-year electronics (EEA) (TP: 38.5 hrs).

autumn 99: Physics recitations for 1st- and 2nd-year medicine (PCEM) (TD: 72 hrs); Physics lab practicals for 3rd-year electronics (EEA) (TP: 24.5 hrs).

## TEACHING EXPERIENCE OTHER THAN BEING PROFESSOR

spring 95,96,97,98,99,05,16,18,20,22,23: HERCULES instructor: Lectures and recitations on diffraction from disordered systems and PDF-analysis (C: 33 hrs, TD: 30 hrs).

1/94 to 5/94: Laboratory instructor at Université Paris-Sud, Orsay: Lab practicals in cristallography and the physics of X-rays for about 25 physics students (3rd- and 4th-year) (C: 4 hrs, TP: 56 hrs).

1/92 to 5/92: Lecturer at McGill Univ., Montréal, PQ, Canada: Lectures and recitations in electromagnetism for 200 1st-year students (C: 39 hrs, TD: 13 hrs).

1/91 to 5/91: Lecturer at McGill Univ., Montréal, PQ, Canada: Lectures and lab practicals in optics and electromagnetism for 150 2nd-year students. In addition to a voluntary reworking of exams, the course curriculum, laboratory experiments and lecture demonstrations, I provided supplementary lectures on error analysis (C: 43 hrs, TD: 13 hrs, TP: 10 hrs).

1/86 to 6/86: Teaching assistant at Cornell Univ., Ithaca, NY, USA: Recitations and lab practicals in electromagnetism and wave mechanics for about 25 2nd-year “honors” students (C: 2 hrs, TD: 30 hrs, TP: 28 hrs).

9/82 to 5/83: Teaching assistant at Purdue Univ., West Lafayette, IN, USA: Recitations and mini-lectures in fundamental physics for about 25 1st-year students, mostly individual instruction (C: 15 hrs, TD: 150 hrs, TP: 15 hrs).

# Other Experience

## INSTRUMENTATION

(ILL, since 4/04): Instrument responsible of the D4 diffractometer and since 5/08 the first responsible as an ILL staff (permanent) scientist. Contributions include data reduction+analysis software (*e.g.* data deconvolution for the instrumental resolution function), development/adaptation of extreme sample environments (Paris-Edinburgh press, aerodynamic levitation with laser heating), and the design of a cryofurnace for D4.

(ILL, 4/04 – 11/09): Co-responsible of the D20 diffractometer and until 3/07 the main scientist responsible for its successful radial oscillating collimator project, involving aspects of design, mechanics, motorisation and control.

(ILL, 6/05 – 5/07): Engaged in the Dracula high-flux diffractometer project, now become the “ExtremeD” diffractometer project for extreme conditions.

(ILL, 5/95 – 8/99): Head of the D4c project, involving the design, fabrication and installation of a new “microstrip” detector system for the D4 neutron diffractometer. Apart from the scientific and technical aspects of the D4c instrument, I was responsible for the budget of 500 000 euros (3.3 MF) and the management of the efforts of about 15 people. The project was wholly successful, on-time and on-budget to within 15 %. In May/June 2000, the final tests and commissioning of the new instrument confirmed that D4c is now the most accurate neutron diffractometer in the world for liquids and glasses, having very low background and a counting rate stability of  $2 \cdot 10^{-4}$  over 3 days.

(ILL, 8/94 – 8/99): Sole responsible of the D4 instrument, a diffractometer for liquids and amorphous materials (I did about 30 expts/year at D4 and other ILL instruments).

(LURE, 1992-94): Improvement and characterisation of the synchrotron beamline D23.

Occasional use of beamlines at synchrotrons of 2nd (NSLS Brookhaven, 1990-92) and 3rd (ESRF since 1998) generation.

(Univ. McGill, 1990-91 and especially Cornell Univ., 1985-89): Repair and automatisa-tion (*e.g.* temperature control) of  $^4\text{He}$  cryostats and  $^3\text{He}/^4\text{He}$  dilution refrigerators.

## SUPERVISION OF THESIS STUDENTS AT THE ILL

(since July 2020): Thesis supervisor for F. Gehlhaar (thesis director: H. Kohlmann, U. Leipzig): Determination of accurate bound coherent neutron scattering lengths,  $b_{\text{coh}}$ , of lanthanide, cadmium, thallium and lithium isotopes.

(12/17 – 12/19): Co-supervisor for R. Mourier (thesis director: Guillaume Ferlat, Univ. Pierre et Marie Curie, Paris): Structural and dynamic properties of borate glasses and liquids in connection with elastic phase transitions.

(10/13 – 10/16): Thesis supervisor for A. Polidori (thesis director: P.S. Salmon, U. Bath): Structure of geological fluids.

(5/15 – 8/15): Thesis supervisor for K. Jurkiewicz (thesis director: A. Burian, Silesian University, Katowice, Poland): Structure of glassy carbons.

(2/09 – 2/12): Thesis supervisor and jury member for J. Kozaily (thesis director: L. Hennet, U. Orléans): Structure and dynamics of levitated molten oxide glasses.

(8/11 – 11/11): Thesis supervisor for N. Woźnica (thesis director: A. Burian, Silesian University, Katowice, Poland): Structure of nanocarbons at the atomic scale.

(1/09 – 12/11): Thesis supervisor for M. Wilkinson (thesis director: N. Skipper, U. College London): Structure and dynamics of aromatic organic molecules in aqueous liquids and nanoscale confinement.

(10/96 – 9/00): Thesis supervisor for D.M. Sullivan (thesis director: G. Neilson, U. Bristol): Critical phenomena in aqueous solutions studied by neutron diffraction.

#### ASSISTANCE TO THESIS STUDENTS (not as official supervisor)

*ILL (8/94 – 8/99 and since 4/04):*

- A. Hafner (Univ. libre de Bruxelles, 5/16 – 8/19): Off-specular neutron reflection from soft buried interfaces.
- V. Cristiglio (U. Orléans, 1/05 – 1/08): structure of molten aluminates by neutron and x-ray diffraction using laser-heated containerless aerodynamic levitation.
- A. de Bernabé (CSIC Madrid, 1/95 – 1/98): simulations of specular and off-specular x-ray diffraction from multilayers.

*LURE (10/92 – 7/94):*

- H.M. Fischer (U. Nancy), O. Durand (LCR Thomson) and O. Pellegrino (CECM Vitry): experiments and simulations of specular and off-specular x-ray diffraction from multilayers.

*McGill (2/90 – 9/92):*

- Y. Huai (U. Montréal): data analysis of x-ray reflectivity of multilayers.
- A. Sahnoune (U. McGill) and A. Dawson (U. McGill): expts at very low T.

*Cornell (9/84 – 1/90):*

- J.R. Olson (U. Cornell) and A.P. Horsfield (U. Cornell): measurements and analysis of thermal properties at low temperature.

#### FOREIGN LANGUAGES (English=native, otherwise CEFR levels as written/oral)

**French:** Living and working in France since Oct 92

**(C2/C2)** Certificate of competence (McGill University, Montréal, Canada)  
for 6 semesters college study (1990–91)

**German:** 8 months working living and working in Garching/München (9/13–4/14)

**(C1/B2)** 5 years (5 × 40 hrs) at the Institut Laue-Langevin, Grenoble (2006–2010)  
Zertifikat Deutsch after 2 semesters study at U. Paris-Sud, Orsay (2003–04)  
2 semesters college study at Cornell University, Ithaca, NY (1988–89)

**Spanish:** Self-study and conversation practice since 2015

**(B2/B1)** 10 semesters high school study (1975–80)

**Russian:** 1 semester at the Institut Laue-Langevin, Grenoble (1997)

**(A2/A1)** 6 weeks college study in Moscow (summer 1984)

Certificate of proficiency (Purdue University, West Lafayette, IN)  
for 7 semesters college study (1981–84)

## COMMUNITY ACTIVITIES

(4/18 – 4/19): Co-organiser of the School and Conference on Analysis of Diffraction Data in real-space (ADD2019) (ILL, Grenoble, 17–22 March 2019).

(7 Dec 2017): Président du jury de thèse de doctorat de Yue Ma, defended at U. Aix-Marseille (CEA Cadarache): “A study of point defects in  $\text{UO}_{2+x}$  and their impact upon fuel properties.”

(since 9/17): Head of the ILL’s Graduate School, and consequently also a member of the Conseil de l’École Doctorale de Physique à l’Université Grenoble Alpes (UGA).

(11/16 – 12/17): Responsible for recording and editing the minutes of the ILL’s Scientific Council meetings.

(11/16 – 12/17): Organizer of the ILL series of Colloquia.

(9/15 – 10/17): Chair of the working group of the Data Protection and Processing (DPP) project at the ILL, responsible for evaluation and revision of the ILL’s Scientific Data Policy.

(6/10 – 6/17): Reviewed  $\sim 12$  manuscripts/year (PRL, PRB, JPCM, JNCS, JCP, etc).

(4/15 – 4/16): Co-organiser of the School and Conference on Analysis of Diffraction Data in Real Space (ADD2016) (ILL, Grenoble, 7–11 March 2016).

(12/14 – 12/16): Scientist Representative at the Institut Laue-Langevin.

(9/13 – 1/17): Member of ORNL’s Disordered Materials SRC (Science Review Committee) – I reviewed SNS (and in principle HFIR) beamtime proposals twice per year, mostly for the NOMAD instrument.

(since 11/14): Review Editor for the “Glass Science” specialty section of the new journal *Frontiers in Materials*.

(7/14): One-time (Ad Hoc) Editorial Board Member of *Physical Review B*.

(9/13 – 4/14): Detached for 8 months to the MLZ/FRM-II neutron facility of the Technische Universität München (TUM) as co-responsible of the TOFTOF and RESEDA instruments.

(4/12 – 4/13): Co-organiser of the School and Conference on Analysis of Diffraction Data in Real Space (ADD2013) (ILL, Grenoble, 18–22 March 2013).

(10/10 – 11/11): Co-organiser of the Analysis of Diffraction Data (ADD2011) in Real Space workshop (ILL, Grenoble, 12–14 Oct 2011).

(6/07 – 5/08): Principal organiser of the Powder Diffraction with 2-Dimensional Detectors (PD2DD) workshop (ILL, Grenoble, 26–27 Feb 08).

(1/04 – 7/06): Expert/Specialist of the ILL’s College 6 Subcommittee, during which time I also contributed to the “tuning” of the Electronic Proposal Review system.

(1 Oct 2004): Rapporteur sur le jury de thèse de doctorat de Fabrice Cavillon, defended at U. Lille: “Caractérisation de la liaison hydrogène dans des systèmes moléculaires d’intérêt biologique par diffusion de neutrons.”

(8 Apr 2004): Rapporteur sur le jury de thèse de doctorat de Stéphane Longelin, defended at U. Lille: “Etude de fluides supercritiques simples ( $\text{CO}_2$ ,  $\text{C}_2\text{D}_6$ ) par diffusion de neutrons, spectroscopie Raman et simulation de dynamique moléculaire.”

(5 Feb 2004): Rapporteur sur le jury d’habilitation à diriger les recherches (HDR) de Denis Morineau, soutenue à l’Université de Rennes I. Domaine de recherche: Physico-Chimie de la matière condensée, systèmes moléculaires confinés et aux interfaces, milieux désordonnés, études expérimentales et par simulation moléculaire.

(1/02 – 12/03): Member of the ILL’s College 6 Subcommittee (Structure and Dynamics of Liquids and Glasses), meeting twice per year. I’m a very active member in the process of judging the scientific merits of beamtime proposals. The Institut Laue-Langevin (Grenoble) operates the world’s most intense neutron source for external scientific users.

(5/01 – 9/03): Proposer and principal scientific organiser/editor of the neutron scattering school “Structure et Dynamique des Systèmes Désordonnés” taking place from 26 to 29 May 2002 under the aegis of the Société Française de la Neutronique (SFN).

(15 June 2001): External expert on the PhD thesis panel of Cédric Pitteloud, defended at U. Lausanne: “Structure de l’eau inter-lamellaire dans le Wyoming montmorillonite étudiée par diffraction des neutrons avec substitution isotopique.”

(6 April 2001): “Molecular Systems” chairman during the ILL’s Millennium Symposium.

(4/01 – 12/08): Elected “titulaire” member of the Commission des Spécialistes (CSE, collègue A) of the 28th CNU section at Université Paris-Sud (Orsay).

(11/97 – 6/01): Member of ISIS’s Scheduling Panel No. 2 (Liquids and Amorphous), meeting twice per year (I was chairman in December 1999). The ISIS Facility (U.K.) operates a neutron spallation source for external scientific users.

(7/98 – 6/99): Expert/Specialist of the ILL’s College 6 Subcommittee (Structure and Dynamics of Liquids and Glasses). I was responsible for giving advice on the feasibility of neutron beamtime proposals in the scientific area covered by College 6.

(5/96 – 7/99): Scientific representative for the ESRF/ILL library committee. As one of the 3 ILL representatives, I acted effectively concerning the library’s budget allocations.

(7/95 – 6/96): College 6 secretary at the ILL. My duties included preparation for the subcommittee meetings, the categorisation of beamtime proposals, the editing of part of the ILL Annual Report, and the organisation of College 6 seminars. I also took the initiative of redefining the keywords (6-01 to 6-05).