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Résumé

April 28th, 2021

- **Professional Experience**

Oak Ridge National Laboratory (ORNL):
Oak Ridge, Tennessee, USA

- Neutron Sciences Directorate, SNS Science Support Group Leader (December 2020 – Present)
- Neutron Sciences Directorate, SNS Scientific Associate Team Leader (September 2012 – November 2020)

The core responsibility of these positions is to provide leadership, mentoring, guidance, a productive work environment, and professional growth opportunities to a Group of Scientific Associates at the Spallation Neutron Source. This Group is responsible for the safe, reliable, and productive operation of 10 neutron scattering instruments, including instrument maintenance, upgrades, and preparation of unique experiments for materials characterization. Currently, Scientific Associate Group Leaders also act as back-up for Group Members. Another crucial part of my role is ensuring development and professional growth opportunities to our Group Members, periodically reviewing and implement new steps for their individual development plans, nurturing interests that mutually benefit their careers and our organization.

While reporting to a separate operations line-management, our Group Members are integral parts of neutron scattering Instrument Teams, working closely with Instrument Scientists, external users, and support Teams on technical and logistical aspects of experiments. Other Group Leaders and I worked for the past several years to refine this model, creating operational consistency and standardization, as well as a robustly compliant environment. This structure also strengthened the bridging of technical knowledge and solutions across the different instrument suites, improving efficiencies and increasing the multidisciplinary technical depth from which all Instrument Teams in the directorate benefit.

Beyond the core roles, the technical reach of this position allows Science Support Group Leaders to act as a "multipliers" within our Groups. Additionally, both the SA and Science Support Group Leader positions also yield room to impact several multidisciplinary areas as individual contributors. A few examples of my individual contributions under this premise are described below.

Selected examples of typical additional contributions during this period (2012-present):

- Subject Matter Expert in high magnetic fields interference and forces, and polarized neutron optics.
- SME and consultant on motion control, instrument technical systems design, analysis of magnetic interferences and forces, and operational suitability for multiple large scale projects (multiple reviews, design input, and assessments for the new 14 T uncompensated magnet under commissioning at the SNS, POWGEN Upgrade Project, SNAP Optics and Imaging Station Upgrade, ARCS Detector System Upgrade, Liquids Reflectometer Improvement Project, Magnetism Reflectometer Improvement Project, and others).
- Implementation of novel fast meta-data acquisition synchronized with the pulsed neutron source.
- Design and integration of polarized neutron optics, special sample environments, and specialized electronics solutions for unique applications.

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- **Experiment Acquisition Team Leader and Lead Engineer, Data Acquisition Operations Team Leader, and Data Acquisition and Controls Electrical Engineer** (October 2004 – August 2012)

Coordinated data acquisition support efforts for neutron scattering instruments operations and installation of new instruments at the Spallation Neutron Source (SNS) and provided leadership to the team, interfacing with the instrument teams to resolve resources and priorities conflicts. Participated in multiple working groups for instruments design, instruments safety reviews, prioritization of work, vendors' qualification, and integrated design reviews for several instruments and systems. Led neutron instruments diagnostics efforts and interactions with other instrument support groups (sample environment, neutron chopper systems, data management/analysis, electrical group, vacuum group, personal protection systems, and others).

Developed and implemented, in collaboration with instrument teams and other members of the DAS group, methods for recording fast meta-data and marking state transition in time-coordination with the neutron events. Provided DAS and electronics support to instrument design teams and coordinated the power and data infrastructure design of several neutron scattering instruments. Specified interfaces between the Personnel Protection Systems and the DAS. Developed custom electronics to interface subsystems to neutron instruments. Reviewed, designed, and commissioned instruments subsystems, and represented instrument design teams in factory acceptance tests. Worked on the reduction of electrical noise in neutron detector systems, supported development and integration of positioning systems, and worked on detector electronics and timing system cards firmware development, diagnostics, and functionality validation.

Established a collaboration for support from the electrical group to the neutron instruments in design, installation, and operation (coordinated the work with the Accelerator Systems Division engineers, designers, and technicians). Worked together with the DAS technicians, software engineers, and the electrical group to define SNS motion control standards to be followed throughout the neutron scattering instruments in the facility.

Selected additional contributions during this period (October 2004 – August 2012):

- Performed magnetic and neutron spin transport calculations supporting the design of specialized magnetic systems. Part of this work eventually led, for example, to the development of the world's first self-shielded asymmetric split coil for neutron scattering instruments (the SLIM-SAM).
- Designed multilayered magnetic shield for photo-multiplier tubes used in the wavelength shifting cross-fiber detectors and performed magnetic calculations to provide forces analysis and specify general magnetic shield needs for different neutron scattering instruments.

- Instruments Systems Electrical Engineer - Spallation Neutron Source Experimental Facilities Division **(**August 2003 – October 2004)

Member of the design team for the neutron scattering instruments that were part of the Spallation Neutron Source (SNS) Construction Project. Provided electrical and electronics engineering support for the neutron reflectometers and the backscattering spectrometer projects. Performed magnetic and neutron spin transport calculations to support the design and commissioning of the Spallation Neutron Source Magnetism Reflectometer.

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Mirrotron Ltd.:
Budapest, Hungary

- Consultant Engineer/Researcher (May – July 2003)

Designed and built a Drabkin neutron spatial spin-resonator adapted to time-of-flight (TOF). Setup and ran magnetic and neutron spin transport calculations. With two other collaborators, assembled a basic polarized neutron scattering instrument in a test beam-line at the Budapest research reactor at the KFKI institute and ran neutron tests with the Drabkin resonator at different conditions.

Argonne National Laboratory (ANL):
Intense Pulsed Neutron Source (IPNS)
Argonne, Illinois, USA

- Resident Associate-Guest - Spallation Neutron Source Project Instruments Systems (April 2000 – April 2003)

Studied the expected features of different neutron moderators planned to be used at SNS and their characteristic pulse shapes. Developed applications to analyze the resolution effects of different pulse shapes and divergence conditions on neutron reflectivity measurements. Collaborated with other SNS researchers to develop software that simulate the resolution effects of spallation neutron pulse shapes in neutron reflectivity measurements.

Determined optimal magnetic field profiles for achieving desirable time-dependant functions of selective neutron spin-flipping to be used in a time-of-flight version of the Drabkin spatial spin-resonator that result in controlled pulse shape tailoring of polarized neutron pulses in spallation neutron sources. Develop applications to model eddy currents in conductive material when running such devices in time dependent (TOF) mode and confirmed the results experimentally. Wrote a Master's dissertation based on this work. Participated in the design of the SNS neutron reflectometers. Studied the basic design principles of the RF-gradient neutron spin-flippers. Wrote software to control a Mezei neutron spin flipper, which was tested in collaboration with Dr. Suzanne te Velthius at the POSY reflectometer (ANL-IPNS). Prepared a complete design package for assembling of an optimized Drabkin spatial neutron spin-resonator for use in TOF applications in pulsed spallation neutron sources.

Synapsis do Brasil S/A (Endesa Corporation)
Rio de Janeiro, RJ, Brazil (based in Porto Alegre, RS, Brazil)

- Electrical Engineer (April 1999 – February 2000)

Led the development of computer applications for electrical studies using load-flow modeling. The system loads the as built configuration of the electric power distribution systems from a database and solves the equations, providing estimates on the existing system capacity. The results are automatically used to determine if new customers can be connected to the desired location of the power grid or if there is the need for capacity expansion. The system is also used for assessing power grid upgrade projects diagnostics, and was developed as part of a large corporate project (Synergya Project, Porto Alegre, RS Brazil), for an electric power distribution company with more than 2,000,000 residential, commercial, and industrial customers.

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Assis-Med Equipamentos Médico-Hospitalares
Cachoeirinha, RS, Brazil

- Technology Development Consultant (February – April 1999)

Invented/designed alternative analog circuitry (demonstrated to be more robust than the microprocessor-based counterparts) for controlling the flow of solutions in dialysis equipment, with accurate temperature-compensated conductivity measurement and signals conditioning.

Hahn Meitner Institut (currently Helmholtz Zentrum) – Berlin GmbH
Berlin, Germany

- Scientific/Engineering Intern (November – December 1998)

Adapted the giant-magneto-resistance (GMR) data acquisition system developed at the HTW-Dresden for use at the Hahn Meitner Institute.

Hochschule für Technik und Wirtschaft
Dresden, Germany

- Scientific/Engineering Intern (October – November 1998)

Developed, using HP-VEE graphical language, computer applications for controlling temperature and magnetic field while measuring correlated giant-magneto-resistance (GMR) in samples.

Contractor for programming, advising and service rendering on Industrial Automation for the following companies from October 1997 to August 1998:

Altus Sistemas de Informática
Porto Alegre, RS, Brazil
Programming of supervisory system for the Usiminas Project (steel mill)
June - August 1998

CIBER (Wirtgen Group)
Porto Alegre, RS, Brazil
PLC programming and operation start up of asphalt plants (Projects: Concessionária Rio-Teresópolis – Rio de Janeiro, Brazil – and Benito Roggio – Buenos Aires, Argentina)
January - May 1998

Máquinas San Martín
Caxias do Sul, RS, Brazil
Consultant on PLC integration and programming (Project: Effem, Eldorado do Sul, RS)
October – December 1997

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Virtual Automação (Rockwell Automation Distributor)
São Leopoldo, RS, Brazil

- PLC Programming Instructor and Sales Engineer (April – December 1997)

PLC programming Instructor, sales and technical support on PLCs, motor drives and interfaces.

Companhia Estadual de Energia Elétrica - FDRH
Porto Alegre, RS, Brazil

- Electronics Maintenance Engineering Intern (April 1996 – January 1997)

Electronics maintenance. As a side project, developed a portable parallel port printer tester.

Federal University of Rio Grande do Sul
Porto Alegre, RS, Brazil

- Scientific Intern at the Nuclear Engineering Department (August 1994 – July 1995)

Conceptual work on the modular fluidized bed nuclear reactor and development of algorithms and software for thermal distribution calculations.

- Scientific intern at the Materials Engineering Department (April 1993 – January 1994)

Software development for solar panel arrays modeling (SolarCAD). Developed and implemented algorithms to solve systems of transcendental equations with optimized calculation step distribution for efficient and timely computation of results.

- Teaching Assistant at the Informatics Institute (July 1992 – December 1992)

Introduction to Applied Informatics, algorithms, and programming.

- **Education**

Master's Degree: **Master of Science in Electrical Engineering (Instrumentation)**
Federal University of Rio Grande do Sul
Engineering School, Electrical Engineering Department
Porto Alegre, RS, Brazil (2000 – 2002)

Bachelor's Degree: **Electrical Engineering**
Federal University of Rio Grande do Sul
Engineering School, Electrical Engineering Department
Porto Alegre, RS, Brazil (1990 – 1996)

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- **Languages proficiency**:

  Portuguese (native)
  English (fluent)
  Spanish (advanced)
  Italian (advanced)
  German (basic knowledge)

- **Publications/Proceedings contributions**

27. A. Huq, M. J. Kirkham, P. F. Peterson, J. P. Hodges, P. Whitfield, K. Page, T. Huegle, E. B. Iverson, A. Parizzi, G. Q. Rennich, ***POWGEN: rebuild of a third-generation powder diffractometer at the Spallation Neutron Source.*** Journal of Applied Crystallography 52, 1189-1201 (2019).

26. A. Tronin, L. J. Maciunas, K. C. Grasty, P. J. Loll, H. Ambaye, A. Parizzi, V. V. Lauter, A. D. Geragotelis, J. A. Freites, D. J. Tobias, J. K. Blasie, ***Voltage-Dependent Profile Structures of a KvChannel via Time-Resolved Neutron Interferometry.*** Biophysical Journal 117(4), 751-766 (2019).

25. F. A. Adlmann, S. Busch, B. Vacaliuc, A. T. Nelson, J. F. Ankner, J. F. Browning, A. Parizzi, J. Bilheux, C. E. Halbert, A. Korolkovas, M. Wolff, ***Normalization of stroboscopic neutron scattering experiments.*** Nuclear Instruments and Methods in Physics Research Section B 434, 61-65 (2018).

24. C. M. Fancher, C. Hoffmann, V. N. Sedov, A. Parizzi, W. Zhou, A. J. Schultz, X. P. Wang, D. Long, ***Time filtering of event based neutron scattering data: A pathway to study the dynamic structural responses of materials.*** Review of Scientific Instruments 89(9), 092803 (2018).

23. G. E. Granroth, K. An, H. L. Smith, P. Whitfield, J. Neuefeind, J. Lee, W. Zhou, V. N. Sedov, P. F. Peterson, A. Parizzi, H. D. Skorpenske, S. M. Hartman, A. Huq, D. L. Abernathy, ***Event-based processing of neutron scattering data at the Spallation Neutron Source.*** Journal of Applied Crystallography 51, 1-14 (2018).

22. C. Jiang, X. Tong, D. R. Brown, A. Glavic, H. Ambaye, R. Goyette, M. C. Hoffmann, A. Parizzi, L. Robertson, V. V. Lauter, ***New generation high performance in situ polarized 3He system for time-of-flight beam at spallation sources.*** Review of Scientific Instruments 88(2), 025111 (2017).

21. F. A. Adlmann, P. Gutfreund, J. F. Ankner, J. F. Browning, A. Parizzi, B.Vacaliuc, C. E. Halbert, J. P. Rich, A. J. C. Dennison, M. Wolff, ***Towards neutron scattering experiments with sub-millisecond time resolution,*** Journal of Applied Crystallography **48**, 220–226 (2015)

20. B. Vacaliuc , P. A. Zolnierczuk, M. Sundaram, A. A. Parizzi, C. E. Halbert,
M. C. Hoffmann, G. C. Greene, J. F. Browning, J. F. Ankner, ***Experiment Automation With A Robot Arm Using The Liquids Reflectometer Instrument At The Spallation***
Neutron Source, ICALEPS 2013 Proceedings (2013)

19. P. A. Zolnierczuk, B. Vacaliuc, M. Sundaram, A. A. Parizzi, C. E. Halbert, M. C. Hoffmann, J. F. Browning, J. F. Ankner, ***Old Wine in New Wineskins: "Upgrading the Liquids Reflectometer Instrument User Control Software At the Spallation Neutron Source"***, Proceedings of the 2012 Future of Instrumentation International Workshop, Oak Ridge, TN USA (2012).

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18. Yaohua Liu, S. G. E. te Velthuis, J. S. Jiang, Y. Choi, S. D. Bader, A. A. Parizzi, H. Ambaye, V. Lauter, ***Magnetic Structure in Fe/Sm-Co Exchange Spring Bilayers with Intermixed Interfaces***, Phys. Rev. B 83, 174418 (2011).

17. Yaohua Liu, S. G. E. te Velthuis, J. S. Jiang, Y. Choi, S. D. Bader, A. A. Parizzi, H. Ambaye, V. Lauter, ***Depth Profiles of Exchange Stiffness and Anisotropy in a Spring Magnet with Intermixed Interfaces***, American Physical Society, Annual APS March Meeting (2011).

16. W-T. Lee, X. Tong, J. Pierce, M. Fleenor, A. Ismaili, J. L. Robertson, W-C. Chen, T. Gentile, A. Hailemariam, R. Goyette, A. A. Parizzi, V. Lauter, F. Klose, H. Kaiser, C. Lavelle, D. V. Baxter, G. J. Jones and L. W. McCollum, ***In-situ Polarized 3He-Based Neutron Polarization Analyzer for SNS Magnetism Reflectometer***, Journal of Physics: Conference Series **251**, 12086 (2010).

15. Y. H. Liu, J. S. Jiang, S. G. E. Te Velthuis, H. Ambaye, A. Parizzi, ***Magnetization profiles in Fe/SmCo Spring Magnets with Graded Interfaces***, American Physical Society, Annual APS March Meeting (2010)

14. Valeria Lauter, Hailemariam Ambaye, Richard Goyette, Wai-Tung Hal Lee, Andre Parizzi, ***Highlights from the Magnetism Reflectometer at the SNS***, Physica B 404 (2009) 2543–2546.

13. H. Ambaye, R. Goyette, A. Parizzi, F. Klose, ***SNS Magnetism Reflectometer***, Neutron News, Volume 19, Issue 3 July 2008, pages 11-13

12. Wai-Tung Hal Lee, Wang Chun Chen, Tom Gentile, Joshua Pierce, Jonny Dadras, Akber Ismaili, Valerie Hanson, Michael Fleenor, J. Lee Robertson, Andre Parizzi, Richard Riedel, Bryan Chakoumakos, David Baxter, Christopher Lavelle, Valeria Lauter, Hailemariam Ambaye, Richard Goyette, Frank Klose, ***In-situ Polarized 3He Neutron Polarization Analyzer For the SNS Magnetism Reflectometer***, Proceedings of the Modern Trends in Neutrons Scattering Instrumentation Workshop, JCNS 2008.

11. H. Ambaye, F. Klose, R. Goyette, A. Parizzi, T. Chae **,** ***Initial Commissioning Results for the SNS Magnetism Reflectometer***, Proceedings of the 18th Meeting of the International Collaboration on Advanced Neutron Sources (ICANS-XVIII, April 25-29, 2007 Dongguan, Guangdong, P R China), 345-349

10. Ian. S. Anderson, Jeremy Cook, Gian Felcher, Tom Gentile, Geoffrey Greene, Frank Klose, Tom Koetzle, Eddy Lelievreberna, Andre Parizzi, Roger Pynn, Jinkui Zhao, ***Polarized neutrons for pulsed neutron sources***, Journal of Neutron Research, Vol. 13, No. 4, December 2005, 193–223

9. A.A. Parizzi, F. Klose, V. Christoph, ***Neutron Polarization Evolution along the SNS Magnetism Reflectometer***, Physica B: Proceedings of the 5th PNCMI (2004), Volume 356/1-4 pages 156-162

8. A.A. Parizzi, F. Klose, Chapter on ***Neutron Spin Flippers*** in the **Report of the Pulsed Polarized Neutrons Workshop, February 10-13, 2003 (Gaithersburg, Maryland - s**ponsored by: The U.S. DOE Office of Science – Basic Energy Sciences and The NSF Division of Materials Research), compiled by Roger Pynn (date published: December 2003)

7. Lee, W.-T.; Te Velthuis, S. G. E.; Zhiya, Z.; Mani, P.; Krishnamurthy, V. V.; Mankey, G. J.; Parizzi, A. A.; Klose, F., ***Ferromagnetic - ferrimagnetic transition in a trilayer Co/Ru/Co synthetic ferrimagnet film***, American Physical Society, Annual APS March Meeting (2003)

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6. A.A. Parizzi, W.-T. Lee, G.P. Felcher, F. Klose, ***Decoupled moderators - Do we always need them? Or: A new approach for pulse shaping***, Journal of Neutron Research 11 (2003) 51 – 60

5. A.A. Parizzi, ***Study, proposal and calculation of expected performance of an energy filter for high wavelength resolution experiments in spallation neutron sources,*** Master's Dissertation, Federal University of Rio Grande do Sul, Engineering School, Electrical Engineering Department, Porto Alegre, RS, Brazil (2002)

4. A.A. Parizzi, W.-T. Lee, F. Klose, ***Modeling the neutron spin-flip process inside a time-of-flight spin resonance energy filter,*** Applied Physics A. Material Science & Processing A74, S1498 – S1501(2002)

3. A.A. Parizzi, W.-T. Lee, F. Klose, ***Possibilities for polarized pulsed neutron instrumentation based on the time-of-flight spin resonance energy filter***, Applied Physics A. Material Science & Processing A74, S1607 – S1609 (2002)

2. A.A. Parizzi, W.T. Lee, F. Klose, ***Requirements for the optical elements of a spin-resonance energy filter for neutrons at reactor and pulsed source instruments***, Neutron Optics (James L. Wood, Ian S. Anderson, Editors), Proceedings of SPIE Vol. 4509 (2001) 114 – 125

1. A.A. Parizzi, G.P. Felcher, F. Klose, ***A Drabkin energy filter for experiments at a spallation neutron source***, ICANS-XV, 15th Meeting of the International Collaboration on Advanced Neutron Sources Proceedings, Tsukuba/Japan, November 6-9, 2000, p. 572 – 580