

RÉSUMÉ

GARY SCOTT COLLINS

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PERSONAL

US Native Citizen, two children. Languages: English (native), French.

PERMANENT POSITION

2002- PROFESSOR OF PHYSICS, and FACULTY MEMBER, MATERIALS SCIENCE AND ENGINEERING PROGRAM
Washington State University, Pullman, WA.

Research in solid-state physics using hyperfine interaction methods, with applications to point defects, lattice locations of impurities, and diffusion. Active in instruction at all levels, including development of an advanced physics laboratory course. Previously active in university faculty governance. In Spring 2012 I ran for Chair of the University Faculty Senate, intending to broaden faculty participation, but losing by a narrow vote.

EDUCATION

1976 DOCTOR OF PHILOSOPHY, Physics, Rutgers University, 1976.
Dissertation: "Temperature Dependence of the Nuclear Quadrupole Interaction in Tin Metal."
PhD Committee: Noémie Benczer-Koller (chair), Georges Temmer, Paul Leath, Bruno Lüthi.

1966 BACHELOR OF ARTS, Physics, Rutgers College, New Brunswick, NJ, 1966.

CAREER SYNOPSIS

- \$4.7M in NSF research grant awards. Principal Investigator of ten grants from the National Science Foundation for \$3.55M to study metals and intermetallic compounds, including nine single-investigator awards at WSU for \$3.29M. Sole Co-PI of additional NSF awards of \$0.91M. Associate Investigator of an additional NSF grant for \$0.45M. A fund to support Collins group research was established in 2006 by former PhD student Praveen Sinha.
- Research advisor to 4 postdoctoral associates, and 11 PhD, 33 MS, 27 undergraduate, and 3 high-school students.
- 108 refereed publications, one edited volume, and 200+ personal presentations at conferences and in seminars. Referee and reviewer for 430 manuscripts and research proposals. Named "*APS Outstanding Referee*" in 2011. Awarded the "*Outstanding Career Achievement Award*", College of Arts and Sciences, WSU, 2019.

ORCID



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OTHER EXPERIENCE

- 2015 VISITING SCIENTIST, Institute for Materialphysics, Westfälische Wilhelm Universität (WWU), Münster (4 mos).
- 1996 VISITING SCIENTIST, Nuclear Solid-State Physics Group, University of Konstanz, Germany (6 months).
- 1995-96 VISITING SCIENTIST, Nuclear Solid-State Physics Group, University of Groningen, The Netherlands (6 months).
- 1985-02 ASSOCIATE PROFESSOR OF PHYSICS, Washington State University, Pullman, WA.
- 1979-85 RESEARCH ASSISTANT PROFESSOR, Physics, Clark University, Worcester, MA.
- 1977-79 POSTDOCTORAL RESEARCH ASSOCIATE & INSTRUCTOR, Physics, Clark University, with Christoph Hohenemser.
- 1976-77 INSTRUCTOR (COADJUTANT), Physics, Rutgers University, New Brunswick, NJ.
- 1968-76 GRADUATE ASSISTANT AND RESEARCH INTERN, Physics, Rutgers University, New Brunswick, NJ.
- 1966-68 PEACE CORPS, Lomé and Baguida, Togo, West Africa. Secondary school math/science teaching in French.

RESEARCH

PAST AND PRESENT INTERESTS

My interest is in the local structure of crystalline solids, studied mostly using hyperfine interactions via two “nuclear probe” methods: perturbed angular correlation of gamma rays (PAC) and Mössbauer spectroscopy. These methods elucidate a broad range of phenomena at the atomic scale. A detailed description of research to 2001 is available elsewhere.

- 1971-79 Quadrupole interactions in non-cubic metals. Studies of the nuclear quadrupole interaction and its temperature dependence. How the electric field gradient (EFG) measured at a probe nucleus depends on the probe.
- 1977-79 Hyperfine field shifts near solutes in ferromagnetic alloys caused to magnetic moment disturbances.
- 1979-85 Magnetic critical phenomena. Static and dynamic critical behavior of ferromagnets, including measurements of the order-parameter exponent β and spin-fluctuation exponent z in iron and nickel alloys and gadolinium.
- 1980-93 Point defects in metals. Production of vacancies and interstitials by plastic deformation. Formation of vacancy complexes with probe atoms in fcc metals, by either accretion of elementary vacancies or trapping of mobile clusters. Annihilation of trapped vacancies by mobile interstitials. Trapping of hydrogen atoms in vacancies.
- 1990-02 Point defects in intermetallic compounds. Structural, equilibrium and deformation-induced point defects. Defect annealing and recovery. Determining defect formation, migration and binding enthalpies. Measuring defect concentrations. Mechanical alloying. Nanocrystalline materials. Probe atoms in grain-boundaries.
- 1999- Lattice locations of solute atoms in intermetallic compounds determined using nuclear quadrupole interactions. Changes in site preferences with composition and temperature. Application of thermodynamic models to determine enthalpies and entropies of transfer of solute atoms between sublattices in compounds. The terminal solubilities of impurities in solid and liquid gallium have also been studied using PAC.
- 2003- Diffusion in compounds studied via nuclear quadrupolar relaxation. Atomic jumps of hyperfine probes that are accompanied by changes in magnitude or orientation of the EFG lead to relaxation of the nuclear quadrupole interaction. The relaxation appears as “damping” and can be fitted to obtain precise mean jump-frequencies. We pioneered this approach in 2004. Jump frequencies were found to be highly sensitive to mean composition. Measurements have given insight into microscopic diffusion mechanisms. This approach is complementary to conventional measurements of the diffusivity made by sectioning penetration profiles.
- 2008-14 Full-potential, all-electron, electronic structure calculations of defect and impurity site energies and EFGs in intermetallic compounds have been carried out in small studies using the *WIEN2k* program to inform our measurements, using a local 8-node workstation as well as a Teragrid supercomputer startup allocation.
- 2014- Solute-solute interactions in intermetallic compounds studied using PAC. This constitutes an extension to intermetallics of measurements made on pure metals in the 1980's by Krzysztof Królak and Tim Cranshaw.
- 2016- Correlation factor in impurity diffusion. By combining results of tracer diffusion measurements at the University of Münster with results of PAC measurements of jump-frequencies here, using the same tracer element, the correlation factor in diffusion of impurities can be determined directly. This is work in progress.
- 2017- Partition of solute atoms. The partition of solutes among sublattices in intermetallic compounds and during grain-boundary segregation are under active study to determine how they varies with alloy composition, mole fraction of solute, and temperature.

MAJOR RESEARCH GRANTS

- 1980-83 NSF grant DMR 80-02443, Solid State Physics Program, *Hyperfine Interactions Studies in Metals, with Applications to Critical Phenomena*. (\$183,353 for three years, at Clark University: Co-Principal Investigator, with Chris Hohenemser, P.I.).
- 1981-86 NSF grant DMR 81-08307, Metals Program, *Lattice Defects in Metals Studied by Hyperfine Interactions*. (\$258,468 for five years, at Clark University: Principal Investigator, with Chris Hohenemser, Co-P.I.).
- 1983-86 NSF grant DMR 83-03611, Low Temperature Physics Program, *Hyperfine Interactions Studies of Magnetic Critical Phenomena*. (\$327,660 for 3.5 years, at Clark University: Co-PI, with Chris Hohenemser, P.I.).
- 1987-90 NSF grant DMR 86-19688, Metals Program, *Point Defects in Metals Studied by Hyperfine Interactions*. (\$240,000 for 3 years, at Washington State University: Principal Investigator).
- 1990-93 NSF grant CTS 89-12430, *Synthesis and Physical Properties of Nanoclusters*. (\$450,000 for 3 years, at Washington State University: Associate Investigator, with Clayton Crowe and Howard Hamilton, P.I.s; John Hirth, Richard Hoagland and Jacob Chung, other Associate Investigators)
- 1990-93 NSF grant DMR 90-14163, Metals Program, *Atomic Structure and Defects in Metals and Alloys Studied by Hyperfine Interactions*. (\$275,000 for 3 years, at Washington State University: Principal Investigator).
- 1993-96 NSF grant DMR 93-13702, Metals Program, *Point Defects in Intermetallic Compounds*. (\$325,000 for 3 years, at Washington State University: Principal Investigator).
- 1996-99 NSF grant DMR 96-12306, Metals Program, *Defects and Diffusion in Intermetallic Compounds*. (\$356,320 for 3 years, at Washington State University: Principal Investigator).
- 2001-04 NSF grant DMR 00-91681, Metals Program, *Studies of Point Defects in Intermetallics using PAC* (\$419,556 for 3+1 years, at Washington State University: Principal Investigator).
- 2005-09 NSF grant DMR 05-04843, Metals Program, *Lattice Location of Solutes and Diffusion in Intermetallics*. (\$500,000 for 4 years, at Washington State University: Principal Investigator).
- 2009-13 NSF grant DMR 09-04096, Metals Program, *Diffusion in Rare-Earth Binary and Ternary Intermetallics Studied using PAC* (\$420,000 for 3+1 years, at Washington State University: Principal Investigator).
- 2010-13 NSF grant DMR 10-06772, Electronic/Photonic Materials, *Characterizing and modifying defects that trap excitons in yttrium aluminum garnets doped with rare-earth elements* (\$397,301 for 3 years, at Washington State University: Co-Principal Investigator, with Farida Selim, P.I.).
- 2014-17 NSF grant DMR 14-10159, Metals and Metallic Nanostructures, *Diffusion and solute-solute interactions in intermetallic compounds*, (\$360,000 for 3+1 years, at Washington State University: Principal Investigator).
- 2018-21 NSF grant DMR 18-09531, Metals and Metallic Nanostructures, *Partition of solute atoms among sublattices in intermetallic compounds*, (\$408,278, for 3 years, at Washington State University: Principal Investigator).

HONORS AND AWARDS

- 1983 Creativity Award from the National Science Foundation for grant DMR 81-08307: G. S. Collins, Principal Investigator. Cited for “*outstanding scientific/ technical progress.*” An unsolicited two-year grant extension with 25% increase in funding. This award is somewhat comparable to a present-day NSF CAREER grant.
- 2005- Praveen Sinha Fund for Physics Research. Praveen graduated from WSU in 1995 with a PhD in physics and MS in computer science. He carried out PhD research in the Collins research group. In December 2005, he established a fund to support Collins group research through a generous, unsolicited donation of \$35,000. In his dissertation research at WSU, he studied point defects produced by quenching or plastic deformation of intermetallic compounds. After graduating, he took a position as NIH postdoctoral research associate in radiation oncology at the University of Wisconsin. He earned a MBA degree in 2000. Since then he helped found several startup companies in areas of software products for managing medical images for hospitals (Ultravisual), personal computer software to protect against malware (Novashield), medical devices (HealthMyne), and has worked as an investment research analyst at Thompson.
- 2019 Outstanding Career Achievement Award, College of Arts and Sciences, Washington State University. There is one such award given each year to one of about 500 faculty in the college.

INFORMATION ON THE WEB

DEPARTMENTAL PROFILE:	https://physics.wsu.edu/people/faculty/gary-s-collins/
RESEARCH GROUP WEB SITE:	http://defects.physics.wsu.edu/ (web page is currently down; an archived version from 2015 can be found at https://goo.gl/WS3qPi .)
COLLINS GROUP RESEARCH ARCHIVE:	http://research.libraries.wsu.edu/xmlui/handle/2376/4184

SENIOR RESEARCH ASSOCIATES AND VISITORS

1998-04	Matthew O. Zacate, Postdoctoral Associate and then Research Assistant Professor, Physics, Washington State University.
2004-	Matthew O. Zacate, Professor, Physics, Northern Kentucky University; Adjunct Professor, WSU.
2009-13	Farida Selim, Research Assistant Professor, Physics, Washington State University. Associate Professor of Physics, Bowling Green University, Bowling Green, Ohio.
2015-16	Debashis Banerjee, Scientific Officer, Bhabha Atomic Research Center (BARC), Kolkata, India, visitor during a three-month leave.*

RESEARCH ADVISING

Postdoctoral	Period	Research topic
Luke S.-J. Peng	May 98 – Feb 99	Point defects in FeAl and NiAl; phase embryos
Matthew O. Zacate	Mar 99 - May 03	Phase embryos, site-preferences in compounds, nuclear quadrupolar relaxation caused by diffusion
Farida Selim	Nov 05 – May 07	Site-preferences and atom movement in compounds
Debashis Banerjee	Nov 15 – Jan 16	Solute-solute interactions in intermetallic compounds

PhD students	Period	Dissertation topic
Carl Allard [†]	Jul 81-May 85	Migration and annealing of point defects in Ni (PAC)
Ataur Rahman Chowdhury [†]	Jul 80-May 85	Static and dynamic critical phenomena (Mössbauer)
Reinhardt B. Schuhmann [†]	Sep 82-May 88	Point defects in fcc metals (PAC)
Steven L. Shropshire	Dec 88-Aug 91	Studies of defects and defect interactions in metals (PAC)
Jiawen Fan	May 89-May 92	Thermal defects in quenched NiAl and CoAl (PAC)
Praveen Sinha	May 90-Jul 95	Defects in quenched and mechanically milled PdIn (PAC)
Bin Bai	May 95-Sep 97	Equilibrium defects in NiAl (PAC)
Shing-Jen (Luke) Peng	May 93-May 98	Defects in annealed and milled FeAl and FeRh (Mössbauer)
John P. Bevington	Aug 08-May 11	PAC and DFT studies of Al ₃ Ni, Al ₃ Ti & Al ₃ Zr, and In ₃ R phases
Randal Newhouse	Dec 07-Oct 12	Diffusion in ordered compounds and pseudo-binary alloys
Ryan Murray	Sep 14-May 17	Solute-solute interactions in intermetallic compounds

[†] Coadvisor of record; advised jointly with Prof. Chris Hohenemser while at Clark University, Worcester, MA.

MS level students	Period	Thesis or research topic
John S. Ochab [†]	Sep 78-May 80	Critical behavior in Rh ₂ FeSn
Hwa-Jae Jang	Jan 87- Jun 88	Hydrogen decoration of vacancies in Pt
Steven L. Shropshire	Jan 87- Dec 88	Point defects in cold-worked metals
Jiawen Fan	Aug 88-May 89	Atomic defects in NiAl
Gregory McGhee	May 88-May 89	Defects in hep Co; non-observation of hydrogen in Au and Cu
Khushairi Zainun	May 88-May 89	Laser surface-melted metals
Steven Parry	May 89-May 90	Cold-fusion calorimetry
Gil-Hong Kim	Jan 90- Jul 90	Defects in annealed and quenched TiAl
John Sy	May 91-Jun 92	Martensitic phase transformation in NiTi
Bruce H. Meeves	May 92- Dec 93	Formation of FeCo and Ni ₃ Fe by mechanical alloying
Bin Bai	May 91- May 95	Grain boundary sites in metals
Mingzhong Wei	May 95 -May 98	Point defects in FeAl studied by PAC

Harmen Thys Nieuwenhuis*	Jan 98 - May 98	Vacancy motion in PdIn
Bonner C. Walsh	Aug 01- May 02	Site selection of solutes in compounds
Denys Solodovnikov	Mar 03 -Dec 03	Diffusion in several rare-earth indide compounds
Aur�lie Favrot**	Jun 03 - Sep 03	Site preference and diffusion of solutes in compounds
Egbert Rein Nieuwenhuis*	Sep 03- Jun 04	(1) Diffusion in Ga ₇ Pd ₃ via nuclear quadrupole relaxation (2) Polymorphic phase transformation in In ₂ La
Jipeng Wang	Sep 03- May 04	Diffusion in LaSn ₃
Li Kang	Nov 03-May 04	Diffusion in CeIn ₃
Lai Wang	Jan 05- May 05	Analytic calculation of Wigner-Seitz volumes in compounds
John P. Bevington	Aug 05-Aug 08	Site preferences and dynamics in intermetallics (experiment)
Xiao Wang	Jan 06- May 07	Defects in II-VI semiconductors such as ZnS studied using PAC
Arriety Lowell	Jan 06- May 07	Site preferences in rare-earth aluminides having C15 structure
Xia (Sean) Jiang	Jan 07- May 08	Jump frequencies of In/Cd probe atoms in L1 ₂ gallides
Xiangyu (Desmond) Yin	Oct 09- May 11	PAC studies gallium and eutectic gallium alloys
Qiaoming Wang	Jan 11- May 12	Site preferences and diffusion in rare-earth palladides
Mark Kohan	Summer 2013	Miedema model for site preferences of solutes in compounds
Sherry Orton	Apr 14- Jul 15	Modeling defect concentrations and diffusion in ordered alloys
Krystal Kasal	Jun 14- Jun 15	Investigations of ternary alloys using PAC
Kyle Elsasser	Aug 18- Dec 18	Solutes in intermetallics
Windy Olsen	Nov 17-	Solutes in intermetallics
Annesh Mukhopadhyay	Nov 18- Dec 20	Solutes in intermetallics
Bryant Ward	Nov 18-	Solutes in intermetallics

[†] Coadvisor of record; advised jointly with Prof. Chris Hohenemser, at Clark University, Worcester, MA.

* Visiting graduate students from the University of Groningen, The Netherlands, who carried out research here in partial fulfillment of requirements for their MS degrees at Groningen.

** Visiting graduate student from Institute Nationale des Sciences Appliqu es (INSA), Rennes, France, carrying out research at WSU in partial fulfillment of her MS degree.

Undergraduate Student	Period	Thesis or research topic
Samuel W. Porter [†]	Sep 79-May 80	Splat-quenched, amorphous Fe ₈₀ B ₂₀ (M�ssbauer)
Gil P. Stern [†]	Sep 80-May 81	Point defects in deformed fcc metals
Reinhardt B. Schuhmann [†]	Sep 81-May 82	Point defects in Ni in annealing stage III
Andrew Vaught	Sep 88-May 89	Embedded atom method calculations
Phillip Himmer	May 88-Aug 89	Point defects in oxides & palladium
Stacy Irwin	May 89-Dec 89	Point defects in rhodium
Kirk Burris	May 90-May 91	Defects in alloys; nanoclusters
Andrew Janssen	Sep 98-Dec 98	Point defects in FePd (M�ssbauer)
Matthew Petersen (UI student)	May 99-Aug 99	Point defects in quenched and annealed FePd (M�ssbauer)
Bonner C. Walsh	May 00-Dec 00	Site preferences of solutes in compounds
Slade Jokela	May 01-Aug 01	Solutes in intermetallic compounds
Phillip Peterman	Jan 05- May 05	Numerical calculation of Wigner-Seitz cell volumes
Morgan Emerson	Feb 06 - May 07	Wigner Seitz cells: geometry and contact areas
Stephanie Lage *	May 06- May 07	Dynamics of tracer atoms in intermetallic phases Al ₁₁ R ₃
Ben Norman *	Jan 07- May 08	Solute atoms in "mirror" phases (WSU honors thesis, Oct 07)
Ashley Dorwart ⁺	May 07 - Aug 07	Lattice locations of indium in Gd-Al alloys
Megan Lockwood ⁺	May 08 - Aug 08	Jump frequencies of cadmium tracer atoms in tin intermetallics
Samantha Cawthorne ⁺	May 09 - Aug 09	Diffusion in Al ₄ Sr and Ga ₄ Sr
Kenneth Dorrance *	Jan 10 - Dec 11	Wigner-Seitz cells: calculating volumes and contact areas
Justine Minish ⁺⁺	Jun 10 - Aug 10	Diffusion in pseudo-binary La(In,Sn) ₃ alloys
Lee Aspitarte ⁺⁺	May 10 - Aug 11	Polymorphic and peritectic phase transformations in In ₃ Zr
Jesse Miller	Feb 11 - Apr 12	Temperature dependence of the hyperfine magnetic field in Ni
Benjamin McDonald *	Jan 12 - May 13	Wigner-Seitz cells: predicting site preferences of solute atoms
Ryan Harrison	Summer 2013	Miedema model for site preferences of solutes in compounds
Andrew Bleasdale *	Jan 14 - May 17	Miedema model for site preferences of solutes in compounds
Elyse Waham	Sep 15 - May 16	A qualitative look at the thermodynamics of ternary phases
Gabrielle Schuler	Sep 17 - Dec 17	Solid-solution strengthening of alloys

[†] At Clark University, Worcester, MA.

* Recipients of Undergraduate Research Grants, College of Sciences, or College of Arts and Sciences, WSU.

⁺ Participants in Research Experience for Undergraduates (REU) Summer Schools “Extreme Matter” at WSU, supported in part by the NSF and AFOSR: Ashley was from Nebraska Wesleyan U; Megan was from New Mexico State U., married name now Harberts; Samantha was from Clemson U.

⁺⁺ Supported by REU supplements to NSF grant DMR 09-04096; Justine, from Alma College, Alma, Michigan, was supported in summer 2010; Lee, from WSU, was supported in summer 2011.

High School Students	Period	Research topic
Kyle Slinker, Pullman HS *	Jun 05-Aug 06	Analytic calculation of properties of Wigner-Seitz cells
Justin Ahn, Pullman HS *	Jun 07-May 08	Diffusion in intermetallic compounds including In ₃ Nd
Prastuti Singh, Pullman HS * [†]	Jun 09-May 10	Diffusion in CoGa ₃ phases (<i>Intel Science Talent Search</i> winner)

* Culminating senior projects.

[†] Semifinalist in *Intel Science Talent Search* 2010 based on her research: \$1000 prizes for herself and for Pullman HS.

PUBLICATIONS

A. EDITED VOLUME

Hyperfine Interactions in Nanocrystalline Materials, guest editor Gary S. Collins, *Hyperfine Interactions* **130** (1-4) (Kluwer, Dordrecht, 2000), 300 pages.

B. REFEREED JOURNAL ARTICLES AND CONFERENCE PROCEEDINGS

1. *Systematics of Hyperfine Interactions at Sn and Other 5s-p Diamagnetic Impurities in Ferromagnetic MnSb*, *Phys. Rev. B* **15**, 1235-1238 (1977); G. S. Collins, N. Benczer-Koller and M. Pasternak.
2. *Nuclear Quadrupole Interaction in Tin Metal*, *Phys. Rev. B* **17**, 2085-2097 (1978); G.S. Collins, N. Benczer-Koller.
3. *Effects of Probe Valence on the Conduction Electron Electric-Field Gradient in Noncubic Metals*, *Hyperfine Interactions* **4**, 523-527 (1978); G. S. Collins.
4. *Applications of the Mössbauer Effect to the Characterization of an Amorphous Tin-Oxide System*, *Phys. Rev. B* **19**, 1369-1373 (1979); G. S. Collins, T. Kachnowski, N. Benczer-Koller and M. Pasternak.
5. *Hyperfine Field Distributions in Nickel Alloys Measured by Time Differential Perturbed Angular Correlations*, *Phys. Lett.* **78A**, 201-204 (1980); G. S. Collins, L. Chow, T. Eschrich and C. Hohenemser.
6. *Hyperfine Field Distributions at ¹¹¹Cd Probes in Nickel Alloys: I. Nontransition Metals Solutes Cu and Si*, *Hyperfine Interactions* **2**, 465-470 (1981); G. S. Collins.
7. *Hyperfine Field Distributions at ¹¹¹Cd Probes in Nickel Alloys: II. Transition Metal Solutes Fe, Co, Mn and Rh*, *Hyperfine Interactions* **2**, 471-476 (1981); G. S. Collins.
8. *Critical Behavior of Quenched, Randomly Disordered Ni and Fe Alloys*, *Hyperfine Interactions* **10**, 893-899 (1981); A. R. Chowdhury, C. Allard, R. M. Suter, G. S. Collins, C. Hohenemser and M. A. Kobeissi.
9. *Vacancy Trapping in Plastically Deformed Metals Studied by Hyperfine Interactions*, *Phys. Lett.* **84A**, 289-293 (1981); G. S. Collins, G. P. Stern and C. Hohenemser.
10. *Comparison of Dynamical Critical Behavior in Isotropic Ferromagnets*, *J. Appl. Phys.* **53**, 7942-7944 (1982); C. Hohenemser, L. Chow, A. R. Chowdhury and G. S. Collins.
11. *Mössbauer Measurements of Static Critical Behavior in Disordered FeAl Alloys*, *Phys. Rev. B* **26**, 4997-5008 (1982); G. S. Collins, A. R. Chowdhury, and C. Hohenemser.
12. *Deuterium Desorption and Host Interstitial Clustering in d-irradiated Ni*, in Electronic Structure and Properties of Hydrogen in Metals, ed. P. Jena and C. B. Satterthwaite, (Plenum: N.Y., 1983) p. 589-94; C. Allard, G. S. Collins and C. Hohenemser.
13. *Comment on the Role of Spin Nonconserving Forces in the Critical Dynamics of Fe and Ni*, *Phys. Rev. Lett.* **50**, 1877 (1983); C. Hohenemser, R. M. Suter, L. Chow and G. S. Collins.
14. *Defect Recovery and Trapping in Plastically Deformed Au Studied by Perturbed Angular Correlations of ¹¹¹In*, *Phys. Rev. B* **28**, 2940-2946 (1983); G. S. Collins, C. Allard, R. B. Schuhmann and C. Hohenemser. Erratum: *Phys. Rev. B* **31**, 2528 (1985).
15. *Comparison of Defect Recovery in Proton Irradiated, Deformed and Ion Implanted Ni as Observed by PAC of ¹¹¹In*, *Hyperfine Interactions* **15/16**, 387-390 (1983); C. Allard, G. S. Collins and C. Hohenemser.
16. *Trivacancy Recovery and Formation of a Cubic Symmetry Defect Trap on ¹¹¹In Impurities in Ni*, *Hyperfine*

- Interactions 15/16, 391-394 (1983); G. S. Collins and R. B. Schuhmann.
17. *Anomalous Temperature Dependence of the Quadrupole Coupling Frequency of a Lattice Defect Trapped to ¹¹¹In in Pt*, Hyperfine Interactions 15/16, 395-399 (1983); G. S. Collins and R. B. Schuhmann.
 18. *Nuclear Spin Relaxation of ¹⁶¹Dy in Gd above the Curie Temperature Observed with the Mössbauer Effect*, Hyperfine Interactions 15/16, 617-620 (1983); A. Chowdhury, G. Collins and C. Hohenemser.
 19. *Anomalous Critical Slowing Down of Spin Fluctuations in Gd Observed with ¹⁶¹Dy Mössbauer Effect*, Phys. Rev. B30, 6277-6284 (1984); A. R. Chowdhury, G. S. Collins and C. Hohenemser.
 20. *Vacancy Migration and Accretion in Ni Observed by Perturbed Gamma-Gamma Angular Correlations*, Phys. Rev. B32, 4839-4848 (1985); C. Allard, G. S. Collins and C. Hohenemser.
 21. *An Fe Mössbauer Effect Study of Metastable Al₈₆Fe₁₄ Prepared by Rapid Solidification*, Hyperfine Interactions 26, 963-966 (1986); R. A. Dunlap, K. Dini, G. Stroink, G. S. Collins and S. Jha.
 22. *The Effect of Random Anisotropy on Critical Behavior: Search for Hysteresis and Rounding in FeV using the Mössbauer Effect*, Hyperfine Interactions 28, 673-676 (1986); X. S. Chang, G. S. Collins and C. Hohenemser.
 23. *Anomalous Critical Spin Dynamics in Gd: A Revision*, Phys. Rev. B33, 5070-5072 (1986); A. R. Chowdhury, G. S. Collins and C. Hohenemser.
 24. *Static Universality Class Implied by the Critical Exponents in Gd*, Phys. Rev. B33, 6231-6234 (1986); A. R. Chowdhury, G. S. Collins and C. Hohenemser.
 25. *Observation of Isotropic Critical Spin Fluctuations in Gd*, Phys. Rev. B33, 4747-4751 (1986); G. S. Collins, A. R. Chowdhury and C. Hohenemser.
 26. *Hydrogen and Deuterium Decoration of a Vacancy Complex in Ni*, Phys. Rev. B34, 502-505 (1986); G. S. Collins and R. B. Schuhmann.
 27. *Point Defects in Deformed Metals Studied by Perturbed Gamma-Gamma Angular Correlations*, Materials Science Forum 15-18, 783-788 (1987); G. S. Collins.
 28. *Hydrogen-Vacancy Interactions in Ni Studied by Perturbed Angular Correlations*, Materials Science Forum 15-18, 681-684 (1987); G. S. Collins and R. B. Schuhmann.
 29. *Defects in Laser Surface-Melted Metals Studied by PAC*, in Characterization of Defects in Materials, ed. R. W. Siegel, J. R. Weertman and R. Sinclair, Mat. Res. Soc. Symp. Proc. 82, 53-58; (1987) G. S. Collins, C. Allard, C. Hohenemser and C. W. Draper.
 30. *Perturbed Angular Correlations Studies of Alloys*, in Electronic Structure and Lattice Defects in Alloys, eds. R. W. Siegel and F. E. Fujita (Trans Tech Publications, 1989), p. 139-149; G. S. Collins.
 31. *Hydrogen Decoration of Vacancy Defects in Platinum*, in Nuclear Physics Applications on Materials Science, ed. E. Recknagel and J. C. Soares, NATO ASI Series E: Applied Science (Kluwer, Dordrecht 1988) , vol. 144, p. 415-416; G. S. Collins, H.-J. Jang and S. Shropshire.
 32. *Diffusion and Trapping of Hydrogen in Vacancies in Platinum Studied by PAC*, Defect and Diffusion Forum 66-69, 335-340 (1989); G. S. Collins, S. L. Shropshire and H.-J. Jang
 33. *Production and Migration of Interstitials in Deformed Metals*, Hyperfine Interactions 60, 667-670 (1990); Steven L. Shropshire and G. S. Collins.
 34. *Cage Motion of a Probe Atom in a Vacancy Complex in Pt*, Hyperfine Interactions 60, 651-654 (1990); G. S. Collins, S. L. Shropshire and H.-J. Jang.
 35. *Point Defects in NiAl Near the Equiatomic Composition*, Hyperfine Int. 60, 655-658 (1990); J. Fan, G. S. Collins.
 36. *Stacking Fault Defects in HCP Cobalt Studied by PAC*, Hyperfine Interactions 60, 659-662 (1990); G. McGhee and G. S. Collins.
 37. *Electrolytic Loading of Hydrogen in Metals Studied by PAC*, Hyperfine Interactions 60, 663-666 (1990); G. S. Collins, G. McGhee, S. L. Shropshire, H.-J. Jang, J. Fan and R. B. Schuhmann.
 38. *Laser Surface-Melting of Metals Studied by PAC*, Hyperfine Interact 61, 1339-1342 (1990); G.S. Collins, K. Zainun.
 39. *Perturbed gamma-gamma Angular Correlations: A Spectroscopy for Point Defects in Metals and Alloys*, Hyperfine Interactions 62, 1-34 (1990); G. S. Collins, S. L. Shropshire and J. Fan.
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 41. *Application of PAC to study equilibrium point defects in intermetallic compounds*, Hyperfine Interactions 80, 1257-61 (1993); Gary S. Collins and Jiawen Fan.
 42. *Equilibrium point defects in TiAl studied by PAC*, Hyperfine Interact 79, 745-8 (1993); Jiawen Fan, Gary S. Collins.

43. *Hydrogen binding in vacancy clusters in platinum*, *Hyperfine Interactions* 79, 749-53 (1993); Steven L. Shropshire and Gary S. Collins.
44. *Atomic diffusion in strain fields near solutes*, *Hyperfine Interact* 79, 755-60 (1993); S.L. Shropshire, G.S. Collins.
45. *Grain boundary sites in fcc metals studied by PAC*, *Hyperfine Interact.* 79, 761-764 (1993); Bin Bai and Gary S. Collins.
46. *The martensitic phase transition in NiTi*, *Hyperfine Interactions* 80, 995-998 (1993); John C. Sy, Gary S. Collins.
47. *Indium metal nanoclusters studied by PAC*, *Hyperfine Interactions* 80, 1117-1120 (1993); P. Sinha, G.S. Collins.
48. *Indium nanocrystals studied by perturbed angular correlations*, *Nanostructured Materials* 3, 217-224 (1993); Praveen Sinha and Gary S. Collins.
49. *Formation of FeCo by mechanical alloying*, *Scripta Metallurgica et Materialia* 29, 1319-1323 (1993); Gary S. Collins and Bruce H. Meeves.
50. *Mössbauer and PAC studies of nanocrystalline Fe*, *Hyperfine Interact* 92, 949-953 (1994); P. Sinha, G.S. Collins.
51. *Formation of Ni₃Fe by mechanical alloying*, *Hyperfine Interactions* 92, 955-958 (1994); Bruce H. Meeves and Gary S. Collins.
52. *Hydrogen trapping in vacancies in metals studied by PAC*, in Local Order in Condensed-Matter Physics, eds. S.D. Mahanti and P. Jena (Nova Science Publishers, 1995), pages 85-94, ISBN 1-56072-220-7; Gary S. Collins and Steven L. Shropshire.
53. *Properties of nanocrystalline zinc produced by gas condensation*, *Nanostructured Materials* 4, 103-112 (1994); K. Recknagle, Q. Xia, J.N. Chung, C.T. Crowe, H. Hamilton and G.S. Collins
54. *A new approach to study vacancy defects in high-temperature intermetallic compounds*, by Gary S. Collins and Praveen Sinha, *Materials Research Society Symposium Proceedings*, vol. 364, pp. 59-64, 1995.
55. *Atomic defects and disorder in mechanically-milled intermetallic compounds*, *Materials Science Forum* 225-227, 275-80 (1996); Gary S. Collins and Praveen Sinha.
56. *Point defects in B2 intermetallic compounds*, *Hyperfine Interactions (C)* 1, 380-384 (1996); Gary S. Collins, Praveen Sinha and Mingzhong Wei.
57. *Point defects in FeAl*, *Il Nuovo Cimento* 18D, 329-336 (1996); Gary S. Collins and Luke S.J. Peng.
58. *Disordering of FeAl by Mechanical Milling*, *Materials Science Forum* 235-238, 535-541 (1997); Luke S.J. Peng and Gary S. Collins.
59. *Equilibrium point defects in NiAl and similar B2 intermetallics studied by PAC*, in Structural Intermetallics 1997, eds. M.V. Nathal et al. (The Minerals, Metals and Materials Society, 1997) ISBN 0-87339-375-9, pages 43-52; Gary S. Collins, Jiawen Fan and Bin Bai.
60. *Point defects and the B2 to fcc transformation in milled FeRh*, by Luke S.-J. Peng and Gary S. Collins, in Phase Transformations and Systems Driven Far From Equilibrium, eds. E. Ma, P. Bellon, M. Atzmon, R. Trivedi, *Mat. Res. Soc. Symp. Proc.* 481, 631-636 (1998).
61. *Vacancy mobility in nickel aluminide versus composition*, by Bin Bai, Jiawen Fan and Gary S. Collins, in Diffusion Mechanisms in Crystalline Materials, eds. Y. Mishin, N.E.B. Cowern, C.R.A. Catlow, D. Farkas, G. Vogl, *Mat. Res. Soc. Symp. Proc.* 527, 203-208 (1998).
62. *Stochastic vacancy motion in B2 intermetallics studied by PAC*, by Bin Bai, Gary S. Collins, Harmen Thys Nieuwenhuis, Mingzhong Wei and William E. Evenson, in Diffusion Mechanisms in Crystalline Materials, eds. Y. Mishin, N.E.B. Cowern, C.R.A. Catlow, D. Farkas, G. Vogl, *Mat. Res. Soc. Symp. Proc.* 527, 210-205 (1998).
63. *Equilibrium defects and concentrations in nickel aluminide*, by Bin Bai and Gary S. Collins, in High-temperature ordered intermetallic alloys VIII, eds. E.P. George, M. Mills and M. Yamaguchi, *Materials Research Society Symposium Proceedings* 552, KK8.7.1-6 (1999) (Page numbers are as listed.)
64. *Thermal defects in B2 iron aluminide*, by Gary S. Collins, Luke S.-J. Peng and Mingzhong Wei, in High-temperature ordered intermetallic alloys VIII, eds. E.P. George, M. Mills and M. Yamaguchi, *Materials Research Society Symposium Proceedings* 552, KK4.2.1-6 (1999). (Page numbers are as listed.)
65. *Deformation-assisted decomposition of unstable Fe₅₀Cu₅₀ solid solution during low-energy ball milling*, by J. Xu, G.S. Collins, L.S.J. Peng and M. Atzmon, *Acta Materialia* 47, 1241-53 (1999).
66. *Search for nucleation of phase embryos in binary alloys by impurity atoms*, by Gary S. Collins, Luke S.-J. Peng and Matthew O. Zacate, *Z. Naturforschung* 55a, 129-133 (2000).
67. *Structural, thermal and deformation-induced point defects in PdIn*, Gary S. Collins and Praveen Sinha, in Hyperfine Interactions in Nanocrystalline Materials, guest ed. G.S. Collins, *Hyperfine Interactions* 130, 151-79 (Kluwer 2000).

68. *Vacancy Jumps in PdIn: Reconciling Nuclear Relaxation and Diffusion Measurements*, Gary S. Collins and Harmen Thys Nieuwenhuis, Defect and Diffusion Forum 194-199, 375-83 (2001).
69. *Vacancy-vacancy interactions in NiAl*, Matthew O. Zacate and Gary S. Collins, Defect and Diffusion Forum 194-199, 383-88 (2001).
70. *Nucleation of a second phase by individual impurity atoms*, Matthew O. Zacate, Gary S. Collins and Luke S.-J. Peng, Materials Science and Engineering A 329-331, 920-924 (2001).
71. *Site preference model for hyperfine impurities in compounds*, Gary S. Collins and Matthew O. Zacate, Hyperfine Interactions 136/137, 641-646 (2001).
72. *Site preferences of hyperfine impurities in Ni₂Al₃ phases*, Matthew O. Zacate and Gary S. Collins, Hyperfine Interactions 136/137, 647-652 (2001).
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74. *Stochastic model of PAC nuclear relaxation caused by defects hopping on a simple cubic lattice*, Taylor D. Grow, Stephanie Plamondon, William E. Evenson and Gary S. Collins, Hyperfine Interactions 136/137, 627-632 (2001).
75. *Influences of lattice sinks and defect interactions on solutes in compounds*, Gary S. Collins and Matthew O. Zacate, Mat. Res. Soc. Symp. Proc., vol. 719, pages F8.19.1-F8.19.6 (2002).
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83. *Jump frequency of Cd tracer atoms in β-Mn*, Matthew O. Zacate and Gary S. Collins, Defect and Diffusion Forum 237-240, 396-401 (2005).
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91. *Jump frequencies of Cd tracer atoms in Ll₂ lanthanide gallides*, Xia Jiang, Matthew O. Zacate and Gary S. Collins Defect and Diffusion Forum 289-292, 725-732 (2009).
92. *Change of diffusion mechanism with lattice parameter in the series of lanthanide indides having Ll₂ structure*, Gary S. Collins, Xia Jiang, John P. Bevington, Farida Selim and Matthew O. Zacate, Physical Review Letters 102,

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93. *Relating PAC damping to EFG fluctuation rates via the PAC relaxation peak*, Tyler Park, Jeffrey A. Hodges, Carlos Moreno, Michael Stufflebeam, William E. Evenson, P. Matheson, Matthew O. Zacate and Gary S. Collins, *Hyperfine Interactions* **199**, 397-402 (2011). DOI 10.1007/s10751-011-0332-6.
94. *Comparison of jump frequencies of $^{111}\text{In}/\text{Cd}$ tracer atoms in Sn_3R and In_3R phases having the L1_2 structure (R= rare earth)*, Megan Lockwood, Benjamin Norman, Randal Newhouse and Gary S. Collins, *Defect and Diffusion Forum*, **311**, 159-166 (2011).
95. *Fitting PAC spectra with stochastic models: PolyPacFit*, M.O. Zacate, W.E. Evenson, R. Newhouse and G.S. Collins, *Hyperfine Interactions* **197** (2010) 223-227.
96. *Diffusion in binary and pseudo-binary L1_2 indides, stannides, gallides and aluminides of rare-earth elements as studied using perturbed angular correlation of $^{111}\text{In}/\text{Cd}$* , Randal Newhouse, Justine Minish and Gary S. Collins, *Defect and Diffusion Forum* **323-325** (2012) 447-452. <http://arxiv.org/abs/1109.2261>
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<http://www.scientific.net/DDF.323-325.453>
98. *The solubility of indium in liquid gallium supercooled to 12K*, Xiangyu Yin and Gary S. Collins, *Defect and Diffusion Forum* **323-325** (2012) 503-508. <http://arxiv.org/abs/1109.2263>
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99. *Positron-lifetime measurements of hydrogen passivation of cation vacancies in yttrium-aluminum oxide garnets*, Farida A. Selim, C.R. Varney, M.C. Tarun, M.C. Rowe, G.S. Collins and M.D. McCluskey, *Physical Review B* **88**, 174102 (2013), 5 pages. <http://prb.aps.org/pdf/PRB/v88/i17/e174102>
100. *Nuclear quadrupole interactions of $^{111}\text{In}/\text{Cd}$ solute atoms in a series of rare-earth palladium alloys*, Qiaoming Wang and Gary S. Collins, *Hyperfine Interactions* **221**, 85-98 (2013). <http://dx.doi.org/10.1007/s10751-012-0686-4>. <http://arxiv.org/abs/1209.3822>.
101. *Determination of the crystal structures of $\text{In}_{70}\text{-Ni}_{30}$ and $\text{In}_{70}\text{-Pd}_{30}$ using perturbed angular correlation*, Lee Aspirtarte, Egbert R. Nieuwenhuis and Gary S. Collins, *Hyperfine Interactions* **221**, 73-78 (2013). <http://dx.doi.org/10.1007/s10751-012-0678-4>. <http://arxiv.org/abs/1210.3076>.
102. *Impurity diffusion in highly-ordered intermetallic compounds studied via nuclear quadrupole interactions*, Gary S. Collins, Qiaoming Wang and John P. Bevington, *Diffusion Foundations* **2**, 95-106 (2014). <http://arxiv.org/abs/1403.6515>
103. *Solute-solute interactions in intermetallic compounds*, Debashis Banerjee, Ryan Murray, Gary S. Collins and Matthew O. Zacate. *Hyperfine Interact* (2017) 238:18. (15 pages). Available for view at <http://rdcu.be/ouAx>. <http://dx.doi.org/10.1007/s10751-016-1393-3>.
104. *Segregation of solute atoms to interphase boundaries in GdNi_2* , Ryan Murray, Debashis Banerjee, Gary S. Collins and Matthew O. Zacate. *Hyperfine Interact* (2017) 238:17. (11 pages). Available for view at <http://rdcu.be/ouez>. <http://dx.doi.org/10.1007/s10751-016-1394-2>.
105. *Site occupation of indium and jump frequencies of cadmium in FeGa_3* , Randal Newhouse, Gary S. Collins and Matthew O. Zacate. *Hyperfine Interact.* (2017) 238:137. (12 pages). Available for view at <http://rdcu.be/o7u2>. <http://dx.doi.org/10.1007/s10751-016-1341-2>.
106. *Diffusion and equilibration of site-preferences following transmutation of tracer atoms*, Gary S. Collins, in *Diffusion and Thermal Transport in Bulk and Nano-materials*, ed. Helmut Mehrer, *Diffusion Foundations* **19**, 61-79 (2019), 19 pages. Dedicated to Nico Stolwyck. <https://arxiv.org/abs/1805.03264>
<http://dx.doi.org/10.4028/www.scientific.net/DF.19.61>
107. *Simulation of intrinsic defects and Cd site occupation in LaIn_3 and LuIn_3* , M.O. Zacate, J.P. Bevington and G.S. Collins, *Diffusion Foundations* **27**, 40-49 (2020), ten pages.
108. *Atom motion in solids following nuclear transmutation*, Gary S. Collins, *Diffusion Foundations* **27**, 186-196 (2020), 11 pages. <https://arxiv.org/abs/1907.07264>

C. IN PREPARATION

1. *Jump-frequencies of indium probe atoms in phases having the Al_4Ba structure*, Gary S. Collins, Randal Newhouse, Samantha Cawthorne, Matthew Zacate (to be presented at the DIMAT conference, Debrecen, July 4-7, 2021).
2. *Jump-frequencies and lattice locations of indium solute atoms in phases of $FeGa_3$ structure*, Gary S. Collins, Randal Newhouse, Prastuti Singh (to be submitted).
3. *Solubility and partition of In solute among sublattices in intermetallic $GdAl_2$* , Ryan Murray and Gary S. Collins (to be submitted to Physical Review B).
4. *Dependence of solute transfer between sublattices of eight Al_2R (R = rare earth) phases on composition and temperature*, Windy Olsen and Arriety Lowell, to be submitted.
5. *Correlation effects for tracer diffusion of Cd in Ni_3Al* , Bengü Tas, Ankit Gupta, Gary Collins, Tilmann Hickel and Sergiy V. Divinski, (to be submitted).
6. *Jump-frequencies and diffusion of indium atoms in phases of $FeGa_3$ structure*, Randal Newhouse, Prastuti Singh, Matthew O. Zacate, Gary S. Collins (to be submitted).
7. *Determination of the formation enthalpy of a four-defect in $GdAl_2$ and $HoAl_2$* , Windy Olsen, Bryant Ward and Annesh Mukhopadhyay (to be submitted).

D. UNREFEREED AND OTHER PUBLICATIONS

1. Three-Year Progress Report 1976-79, Hyperfine Interactions Group, Clark University, October 1979, 138 pages; eds. G. S. Collins and C. Hohenemser.
2. Book review: Physics for Scientists and Engineers, Sheldon H. Radin and Robert T. Folk; Prentice-Hall, Englewood Cliffs, NJ 1982; Amer. Jour. Phys. 53, 382-3 (1985).
3. Book review: Rules of Thumb for Physical Scientists, D. J. Fisher, Trans Tech Publications, Switzerland; Amer. Jour. Phys. 57, 669 (1989).
4. *Deuteron Tunneling at Electron-Volt Energies*, G. S. Collins, J. W. Norbury and J. S. Walker, Journal of Fusion Energy 9, 409-11 (1990).
5. Preface, Hyperfine Interactions of Nanocrystalline Materials, ed. G.S. Collins, Hyperfine Int. 130, 1-3 (2000).
6. *Thermodynamic model of solute site preferences in ordered alloys*. Gary S. Collins and Matthew O. Zacate (submitted Phys Rev B, 2001; posted to arxiv, 2015; 44 pages, 7 tables, 9 figures). <http://arxiv.org/abs/1503.08068>

E. COLLINS GROUP RESEARCH ARCHIVE

WSU Research Exchange, <https://research.libraries.wsu.edu/xmlui/handle/2376/4184>

Includes technical reports (dissertations and theses) prepared under National Science Foundation grants 09-04096 and 14-10159. Also houses a large data archive containing most PAC spectra collected over more than three decades of research at WSU under ten single-investigator NSF grants. Currently has all data since 2000. The archive satisfies in part requirements by the NSF to make available to the public raw data collected with NSF support.

PROFESSIONAL SERVICE

Editorial boards and editorships:

Associate Editor, Hyperfine Interactions (Springer, 1998-now)
 Editorial Advisory Board Member, Materials Science Foundations (Trans Tech, 1997-now)
 Member, Editorial Board, Solid-State Phenomena (Trans Tech, ~2000-now)

Named “*Outstanding Referee of the American Physical Society*”
 January 2011

Journal article referee: (342 reports, 1982-2020)

Acta Materialia, Applied Physics Letters, Chemical Physics (Elsevier), Chemical Physics Computer Physics Communications, Europhysics Letters, Hyperfine Interactions (*many*), IEEE Transactions on Magnetics, Inorganic Chemistry, Intermetallics, International Journal of Alloys and Compounds, Journal of Applied Physics, Journal of Chemical Physics, Journal of Fusion Technology, Journal of Magnetism and Magnetic Materials (*many*), Journal of Materials Engineering and Performance, Journal of Materials Research, Journal of Nuclear Materials, Journal of Physical Chemistry, Journal of Physical Chemistry Letters,



Journal of Physics: Condensed Matter (*many*), Journal of Physics D: Applied Physics, Journal of the Physics and Chemistry of Solids, Materials Research Society Symposium Proceedings, Materials Science and Engineering A, Metallurgical and Materials Transactions A, Metallurgical Transactions A, Modeling and Simulation in Materials Science and Engineering, Nanotechnology, New Journal of Physics, Nuclear Instruments and Methods B: Beam Interactions with Materials and Atoms, Philosophical Magazine, Physical Review B (*very many*), Physical Review Letters (*very many*), Physical Review Materials, Physics Letters A, Scripta Metallurgica et Materialia, Spectroscopy, Thin Solid Films
Also ten or so additional submissions refereed at national and international conferences.

Proposal reviewer: (101 reviews, 1981-2020)

Czech Science Foundation, Department of Energy (DOE) Materials Science Division (regular and SBIR), DOE Solid State Physics and Materials, FOM Materials Science (The Netherlands)
 FWO Science Research Foundation (Flanders), Idaho Board of Education Special Research Grant, International Science Found. (George Soros), Israel Science Found., Louisiana Board of Regents, National Research Foundation (South Africa),

National Science Foundation (NSF): CAREER, Ceramic and Electronic Materials, Chemistry (Materials Synthesis and Processing), Ceramics, Condensed Matter Physics, Electronic Materials, International Programs, Low Temperature Physics, Major Research Instrument., Metals and Metallic Nanostructures, Research Experience for Undergraduates, Solid State Physics, Two and Four Year College Instrument.
 Natural Sciences and Engineering Research Council (NSERC), Canada; and NSERC Discovery Grants, Petroleum Research Fund, Research Corporation, Rustaveli National Science Foundation, Georgia (former SSR), Severo Ochoa, Grant Program for Research Centers, Spanish National Agency for Scientific Research (ANEP), Tata Institute for Fundamental Research, Mumbai,
 US Civilian Research and Development Foundation (Cooperative grants between Eurasian and US researchers)
 US Civilian Research and Development Foundation and Russian Foundation for Basic Research
 (2008 Cooperative Grant Program--RFBR Multidisciplinary Climate Change Competition)

Book proposal reviewer: CRC Press, Taylor and Francis Publishers, Dec. 2004; Elsevier, Feb. 2015.

Proposal review panelist: National Science Foundation, Condensed Matter Physics, CAREER grants, Jan. 1997.
 National Science Foundation, DMR, MMN (Metals), remote review panels, Feb. 2016, Feb. 2019.
 Louisiana, Board of Regents Research Competitiveness Subprogram (Phys and Astro, 2019).

Program review panelist: Department of Energy, Materials Science Program, Bethesda, May 1993.

Conference organization:

Member, International Advisory Committees, *International Conferences on Hyperfine Interactions*: Leuven 1995; Johannesburg 1998; Park City 2001; Bonn 2004; Iguassu Falls, Brazil 2007; Geneva 2010; Beijing 2012; Canberra 2014; Leuven 2016; Goa 2019. Starting 2007, this conference series was held jointly with the *International Symposium on Nuclear Quadrupole Interactions*. Starting in 2016, joint meetings have been entitled *International Conference on Hyperfine Interactions and their Application*.
 Co-chair, Local Organizing Committee, *Northwest Section Meeting*, American Physical Society, May 20-21, 2004, University of Idaho and Washington State University, Pullman, WA and Moscow, ID

Technical workshops attended:

15th WIEN2k FLAPW-*lo* Calculation Workshop, Vienna, March 25-29, 2008; organized by Prof. Dr. Karlheinz Schwarz and Peter Blaha, Technical University of Vienna. <http://www.wien2k.at/events/ws2008/>
 ISOLDE Users' Workshop, European Center for Nuclear Research (CERN), November 18-19, 2008, Geneva. <http://indico.cern.ch/conferenceDisplay.py?confId=36293>

Affiliations at Washington State University:

Materials Science and Engineering Program (1987- now); Center for Materials Research (1989- now).

Professional society memberships and committees:

American Physical Society (APS), active
 American Association of University Professors (AAUP)
 Materials Research Society (MRS) and The Minerals, Metals & Materials Society (TMS) (past)
 Chemistry and Physics of Materials Committee, TMS, member, elected 1995-98.

Consulting (3 brief consultantships)Evaluations for Promotion, Tenure, and Awards (11 between 1994 and 2009)Professional leaves

- 1995 Nuclear Solid-State Physics Group, Department of Physics, University of Groningen, The Netherlands (6 months). Research with Frits Pleiter and other members of group of ~20 staff and students.
- 1996 Nuclear Solid-State Physics Group, Department of Physics, University of Konstanz, Germany (6 months). Research with Manfred Deicher and other members of group of about 30 staff and students belonging to research groups of Professors Ekhard Recknagel and Günter Schatz.
- 2002 Visits at European universities: Univ. of the Saarlandes (Prof. Dr. Thomas Wichert), Univ. of Paderborn (Prof. Drs. Gerhard Wortmann and Wilfried Holtzapfel), Univ. of Leipzig (Prof. Drs. Tilman Butz and Wolfgang Tröger), Univ. of Göttingen (Prof. Dr. Peter Lieb), Technical Univ. of Vienna (Prof. Dr. Walter Steiner), and Univ. of Vienna (Prof. Drs. Wolfgang Pfeiler and Gero Vogl).
- 2008 Visits at European universities: Univ. of the Saarlandes (Prof. Dr. Thomas Wichert), Univ. of Leipzig (Prof. Dr. Tilman Butz), Univ. of Hannover (Prof. Dr. Paul Heitjans), Univ. of Muenster (Prof. Drs. Nicolaas Stolwijk and Christian Herzig), and the Helmholtz Zentrum Berlin (formerly Hahn Meitner Institute; Drs. Rainer Sielemann and Heinz-Eckhard Mahnke). Discussions about possible experiments with exotic PAC probes at the online isotope separator and implantation facility ISOLDE, CERN, Geneva, with Manfred Deicher and Thomas Wichert, Uni-Saarlandes. Collaboration with Matthew Zacate, Northern Kentucky University, on *ab initio* calculations of atomistic properties of solids and electric-field gradients using the *WIEN2k* full-potential, all-electron program (see <http://www.wien2k.at/>).
- 2015 Institute for Materials Physics, University of Münster, Germany, Spring 2015 (four months). Diffusivity measurements were begun on intermetallic compounds for which jump-frequencies had already been determined at WSU using PAC from nuclear quadrupolar relaxation. Principal coworker at Münster is Sergiy Divinski. Seminars were given at Münster (two, Prof. Gerhard Wilde and PD Sergiy Divinski), Hannover (Prof. Paul Heitjans), Saarbrücken (Prof. Thomas Wichert and PD Manfred Deicher), Leuven (Profs. Kristiaan Temst, André Vantomme and Guido Langouche) and Ghent (Prof. Stefaan Cottenier).
- 2021 Institute for Materials Physics, University of Münster, Germany, Spring 2021 (four months). Travel restrictions due to the pandemic are making it impossible to carry out activities on-site in Münster.

Research collaborations

- 1999-04 Mössbauer studies to determine local environments of Fe-cations in illites, with Prof. Rosenberg, Geology.
- 2002-03 Extended x-ray absorption fine structure (XAFS) experiments to determine lattice locations of impurities in intermetallic compounds, in collaboration with PNC-CAT team, APS, Argonne National Lab (2002-3).
- 2004-05 NMR studies to determine local environments of cations in muscovites and illites, with Prof. Rosenberg, Geology, and Dan Mitchell, PhD, Center for NMR Spectroscopy, WSU.
- 2005-08 PAC studies of ZnS, with Philip Rosenberg, Professor of Geology, WSU, and Xiao Wang, GRA, Physics.
- 2005-08 Luminescence studies of ZnS, with Philip Rosenberg, Prof. of Geology, Xiao Wang, Graduate Student in Physics, Zbigniew Dreger, Research Scientist, Shock Physics Institute, and Baozhou Sun, Postdoctoral Research Associate, Shock Physics Institute.
- 2006-07 Electron spin resonance study of unpaired spins in ZnS samples doped with impurities Cu, Ag, Na and Li., with Philip Rosenberg, Professor of Geology, Xiao Wang, Graduate Student of Physics, and Louis Scudiero, Assistant Professor of Chemistry, WSU.
- 2007-08 Magnetization measurements using a SQUID magnetometer, with You Qiang, Assistant Professor of Physics, University of Idaho.
- 2008- “Radiotracer diffusion in semiconductors and metallic compounds using short-lived isotopes”, Proposal to the ISOLDE and Neutron Time-of-Flight Experiments Committee for beam time, ISOLDE, European Organization for Nuclear Research (CERN proposal stamp CERN-INTC-2009-013 / INTC-P-261), January 18, 2009. Spokesperson: Manfred Deicher. Participants: M. Deicher, G.S. Collins, R. Gerten, J. Kronenbert, M. Türker, F. Wagner, Th. Wichert, H. Wolf and M.O. Zacate. Beam time was awarded in February 2009, and will provide for PAC measurements of jump frequencies of ^{117}In in host probes in indide compounds to complement current studies on ^{111}Cd . Matt Zacate participated in a $^{117}\text{Cd}/\text{In}$ run in November 2010 at CERN.
- 2008- Measurement of jump frequencies of ^{115}In NMR probe atoms in rare earth indides via nuclear quadrupole resonance, with Tim Bastow, CSIRO National Laboratory, Melbourne.
- 2008- Computing properties of solids using *WIEN2k*, a full-potential, all-electron, linearized augmented-plane-wave method (<http://www.wien2k.at/>). Collaborative computations carried out here and by Professor Matthew Zacate of Northern Kentucky University, an Adjunct Professor at WSU.

- 2009- “Defect energies and diffusion mechanisms in intermetallics”, Award from the TeraGrid Project, <http://www.teragrid.org>, DMR090131. New Startup allocation of supercomputer time for *WIEN2k* computations, approved August 2009.
- 2010- “Point defects, site preferences and diffusion in intermetallics”, Award from the TeraGrid Project, <http://www.teragrid.org>, renewal of Startup grant DMR090131, for supercomputer time for *WIEN2k* computations, approved August 2010.
- 2011- “Diffusion in intermetallic compounds studied using short-lived radioisotopes”, Proposal to the ISOLDE Committee for beam time, ISOLDE, European Organization for Nuclear Research (CERN proposal stamp CERN-INTC-2011-010 / INTC-P-294), submitted January 5, 2011. Spokesperson, Matthew Zacate. Participants: M.O. Zacate, M. Deicher, K. Johnston, M. Lehnert, F. Strauss, and G.S. Collins. Beam time was awarded in February 2011, and will provide for PAC measurements of jump frequencies of $^{111m}\text{Cd}/\text{Cd}$ probe atoms in various compounds to complement current studies using $^{111}\text{In}/\text{Cd}$ probes. For both probes, measurements are made for the same 247 keV excited state of ^{111}Cd , but the parent atom differs, so that the probes might occupy different lattice sites at the time of creation of the excited state. Matt Zacate is expected to make measurements at CERN in the near future.
- 2012- Addendum to ISOLDE proposal P261, “Radiotracer diffusion in semiconductors and metallic compounds using short-lived isotopes” (see under 2008- above).

PERSONAL PRESENTATIONS

A. INVITED AND SPECIAL PRESENTATIONS AT CONFERENCES

1. *Anomalous Temperature Dependence of the Quadrupole Coupling Frequency of a Lattice Defect Trapped to ^{111}In in Pt*, Sixth International Conference on Hyperfine Interact., Groningen, The Netherlands, 1983. Plenary talk to ~300.
2. *Point Defects in Deformed Metals Studied by Perturbed Gamma-Gamma Angular Correlations*, International Conference on Vacancies and Interstitials in Metals and Alloys, Berlin, 1986. Plenary talk to ~300.
3. *Application of Perturbed Angular Correlations to the Study of Alloys*, US/Japan Seminar on the Electronic Structure and Defects in Alloys, Honolulu, 1987. NSF sponsored workshop attended by invitation only; plenary talk to ~50.
4. *PAC Studies of Electrolytically Charged Metal Cathodes*, Workshop on Cold Fusion Phenomena, Santa Fe, May 1989. Plenary talk to ~200 and broadcast by satellite across the US.
5. *Perturbed $\gamma\gamma$ Angular Correlations: A Spectroscopy for Point Defects in Metals and Alloys*, Symposium on Hyperfine Interactions and Nuclear Probes in Chemistry, 198th Meeting, American Chemical Society, Miami Beach, September 1989. Invited talk. An organizer was Rolfe Herber, Rutgers University.
6. *Defects and Diffusion in Intermetallic Compounds*, XXV School of Physics: Condensed Matter Studies with Nuclear Methods, Zakopane, Poland, May 1990. Invited talk.
7. *Equilibrium Point Defects in NiAl and CoAl*, International Conference on Diffusion and Defects in Solids (DD-91), held onboard a boat travelling from Moscow to Perm along the Volga and Kama Rivers, USSR, June 26 - July 4, 1991 (sponsor: Institute of Metal Physics, Sverdlovsk). Invited talk.
8. *Local Lattice Strains and Defect Reactions in Metals*, International Conference on Diffusion and Defects in Solids (DD-91), Held on board a river boat from Moscow to Perm on the Volga and Kama Rivers, USSR, June 26 - July 4, 1991 (sponsor: Institute of Metal Physics, Sverdlovsk). Plenary talk.
9. *Atomic Diffusion in Strain Fields Near Solute*, Ninth International Conference on Hyperfine Interactions (HFI-IX), Osaka, August 1992. Plenary talk to ~300.
10. *New Method to Study Equilibrium Defects in Intermetallic Compounds*, Symposium on Diffusion in Ordered Alloys and Intermetallic Compounds, TMS Fall Meeting, Chicago, November 1992 (invited contributed paper talk).
11. *Hydrogen Trapping in Vacancies in Metals Studied by PAC*, International Symposium on Local Order in Condensed Matter Physics, Jekyll Island, Georgia, June 14-17, 1993. Invitation-only symposium; plenary talk.
12. *A new approach to study vacancy defects in high-temperature intermetallic compounds*, Symposium on High-Temperature Ordered Alloys, Materials Research Society, Annual Meeting. Boston, November 1994. Plenary talk to ~400.
13. *Atomic defects and disorder in mechanically-milled intermetallic compounds*, Internat. Sympos. on Mechanically

- Alloyed and Nanocrystalline Materials (ISMANAM'95), Quebec City, Canada, July 1995. Plenary talk to ~250.
14. Point defects in FeAl, International Conference on Applications of the Mossbauer Effect (ICAME'95), Rimini, Italy, September 1995. Plenary talk to ~300.
 15. Defects in mechanically-milled FeAl, International Symposium on Mechanically Alloyed and Nanocrystalline Materials (ISMANAM'96), Rome, May 1996. Plenary talk to ~200.
 16. Equilibrium point defects in NiAl and similar B2 intermetallics studied by PAC, Second Internat. Symposium on Structural Intermetallics, Seven Springs Resort, Champion, PA, September 1997. Plenary talk to ~300. Runner-up to best paper award.
 17. Thermal defects in B2 iron aluminide, Materials Research Society Fall Meeting, Boston, December 1998, Symposium KK: High-temperature intermetallic alloys VIII. Plenary talk to ~200.
 18. Hyperfine studies of solids, Symposium on basic and applied science at the interfaces between nuclear, atomic and condensed matter physics: A celebration in honor of the 65th birthday of Noémie Benczer-Koller, Physics Department, Rutgers University, New Brunswick, NJ, May 1, 1999. Invited talk to an audience of about fifty students and colleagues of my former Ph.D. research advisor.
 19. Can impurities in binary alloys nucleate phase embryos?, 15th International Symposium on Nuclear Quadrupole Interactions, July 1999, Leipzig. Plenary talk to audience of about 150.
 20. Vacancy Jumps in PdIn: Reconciling Nuclear Relaxation and Diffusion Measurements, Fifth International Conference on Diffusion in Materials, Paris, July 2000. Plenary talk to audience of about 200.
 21. Hyperfine studies of point defects in intermetallic compounds, Symposium 27: Nuclear hyperfine and exotic particle techniques for studying chemical states, International Chemical Congress of Pacific Basin Societies, Pacificchem 2000, Honolulu, December 2000. Invited talk to an audience of ~40.
 22. Atom movement in solids studied using nuclear quadrupole relaxation, Fifth meeting of the Northwest Section of the American Physical Society, Pullman/Moscow, May 2004, Session J1.001; with Aurélie Favrot, Li Kang, Egbert Nieuwenhuis, Denys Solodovnikov, Jipeng Wang and Matthew O. Zacate. Invited talk.
 23. Diffusion in intermetallic compounds studied using nuclear quadrupole relaxation, International Conference on Diffusion in Materials (DIMAT 2004), 5th meeting, Krakow, Poland, July 19-23, 2004. With Aurélie Favrot, Li Kang, Denys Solidovnikov and Matthew O. Zacate. Oral presentation to an audience of ~120.
 24. PAC probes as diffusion tracers in solids, International Conference on Hyperfine Interactions (HFI 2004) 13th meeting, Bonn, Germany, August 23-27, 2004. With Aurélie Favrot, Li Kang, Egbert Rein Nieuwenhuis, Denys Solidovnikov, Jipeng Wang and Matthew O. Zacate. Plenary invited talk to audience of ~200. A PDF version is available at <http://defects.physics.wsu.edu/HFI-2004-tracers.pdf>.
 25. Nonstoichiometry in line compounds, International Conference on Nonstoichiometric Compounds, Kauai, Hawai'i, April 13-18, 2005. Plenary oral presentation to an audience of ~150. A PDF version is available at <http://defects.physics.wsu.edu/Nonstoichiometry.pdf>.
 26. Atom scale studies of solids using hyperfine interactions, Symposium on Point Defects in Materials, 2006 Annual Meeting of the Minerals, Metals and Materials Society (TMS), San Antonio, March 12-16, 2006. Invited talk.
 27. Simultaneous measurement of tracer jump frequencies on different sublattices in Ga₇Pd₃ using PAC, International Conference on Diffusion and Stresses, Lillafüred, Hungary, September 19-22, 2006 (DS2006). With Egbert Nieuwenhuis and Matthew O. Zacate. Plenary oral presentation to audience of ~40.
 28. Site preferences of ¹¹¹In probe atoms in intermetallics having the Al₃Ti or Al₃Zr crystal structures, 14th International Conference on Hyperfine Interactions, Iguassu Falls, Brazil, August 6-10, 2007. With John P. Bevington and Farida Selim. Plenary oral presentation to an audience of ~100.
 29. Hyperfine interaction studies of local environments of probe atoms in intermetallic compounds, International Workshop on Research Reactor Utilization: 50 years of Safe and Sustainable Operation of the IEA-R1 Research Reactor, São Paulo, Brazil, December 3-6, 2007. Workshop link: <http://bemtevi2.ipen.br/sitio/?idc=1969>. Invited plenary presentation to about 40 attendees.
 30. Motion of cadmium tracer atoms in Al₁₁R₃ phases, Seventh International Conference on Diffusion in Materials, Lanzarote (DIMAT 2008), Canary Islands, October 28-31, 2008. With Stephanie Lage. Oral presentation to an audience of ~30. http://www.ucm.es/info/tuma/quimicas_superficie/dimat1.html

31. *Atom movement in solids studied using PAC spectroscopy*, 11th Annual Meeting of the Northwest Section of the American Physical Society, Vancouver, BC, May 14-16, 2009. Invited plenary presentation to an audience of about 30. <http://www.physics.ubc.ca/apsnw/>
32. *Diffusion in binary and pseudo-binary Li_2 indides, stannides, gallides and aluminides of rare-earth elements as studied using perturbed angular correlation of $^{111}In/Cd$* , Eighth International Conference on Diffusion in Materials (DIMAT2011), Dijon, France, July 3-8, 2011. With Randal Newhouse and Justine Minish. Keynote speech. <http://www.dimat2011.com/>
33. *Nuclear quadrupole interactions of $^{111}In/Cd$ solute atoms in a series of rare-earth palladium alloys*, Qiaoming Wang and Gary S. Collins, Fourth Joint International Conference on Hyperfine Interactions and International Symposium on Nuclear Quadrupole Interactions, Beijing, Sept. 10-14, 2012. With Qiaoming Wang. Invited plenary oral presentation to an audience of ~50. <http://cnps.ac.cn/hfi2012/>
34. *Solute-solute interactions in intermetallic compounds*, Gary S. Collins, with Debashis Banerjee and Ryan Murray. Presented at the International Conference on Hyperfine Interactions and Their Applications, Leuven, Belgium, July 2016, submitted to Hyperfine Interactions (Springer). Plenary PechaKucha talk to an audience of about 100. <http://www.hyperfine2016.be>. Slides of the presentation are at https://iks32.fys.kuleuven.be/files/hyperfine2016_slides/09_PechaKucha-1.2_Collins.pdf. The presentation starts at 12:39 in the video at <https://videolab.avnet.kuleuven.be/video/?id=eec5383c19ce8368758b0b403e9f6552>.
35. *Nuclear Methods in Solids*, Gary S. Collins, Symposium on 50 years of excellence in nuclear physics graduate education at Rutgers University, Department of Physics, Rutgers University, Piscataway, NJ, October 1, 2016. A celebration of the 50 years and of the retirement of Professor Noémie Benczer-Koller, Collins's PhD research advisor. Brief invited contribution.
36. *Determining the correlation coefficient for impurity diffusion in an intermetallic compound*, Ryan Murray, Gary S. Collins, Bengü Tas Kavakbasi and Sergiy Divinski; 13th International Conference on Diffusion in Liquids and Solids (DSL 17), Vienna, June 2017, invited contribution.
37. *Change in site-preference of atoms in solids following transmutation*, Gary S. Collins, 15th International Conference on Diffusion in Liquids and Solids (DSL 2019), Athens, June 2019, invited contribution.
38. *Jump-frequencies of solute atoms in Al_4Ba ($D1_3$) phases*, Randal Newhouse, Samantha Cawthorne, Matthew O. Zacate, Gary S. Collins; 16th International Conference on Diffusion in Liquids and Solids (DSL 2019), Malta, June 29-July 3, 2020, invited contribution. [cancelled due to the coronavirus pandemic].
39. *Jump-frequencies of indium probe atoms in phases having the Al_4Ba structure*, Gary S. Collins, Randal Newhouse, Samantha Cawthorne, Matthew Zacate; 11th International Conference on Diffusion in Materials (DIMAT 2021), Debrecen, Hungary, July 4-7, 2021, invited contribution

B. INTERNATIONAL CONFERENCES (81 personal presentations)

C. NATIONAL MEETINGS (22 personal presentations)

D. REGIONAL MEETINGS (14 personal presentations)

E. SEMINARS, COLLOQUIA AND OTHER MEETINGS (116 personal presentations)

TEACHING

OVERVIEW OF COURSES TAUGHT

Graduate Level

Solid State Physics (Ashcroft and Mermin, Kittel, Simon)
 Diffusion and Defects in Solids (Shewmon)
 Electromagnetic Theory (Jackson)
 Quantum Physics Laboratories (Melissinos)
 Thermal and Statistical Physics (Callen, Mattis)
 Seminars in Solid-State and Condensed-Matter Physics:
 Solid State Spectroscopy; Materials Physics
 Point Defects in Solids (Agullo-Lopez, Catlow, Townsend)
 Atom Movement in Solids (Philibert)
 Nuclear Methods in Solids (Schatz and Weidinger)
 Solid-State Physics (Simon, Kittel, Ashcroft and Mermin)

Undergraduate Level

Introductory Physics
 Modern Physics (Arya, Krane, Eisberg & Resnick, Harris)
 Electricity and Magnetism (Griffiths)
 Electronics Laboratories (Diefenderfer, Barnaal)
 Quantum Physics Laboratories (Melissinos)
 Honors Seminar in Particle Physics
 Thermal Physics (Kittel & Kroemer, Gould & Tobachnik)
 Solid State Physics (Simon, Kittel)

GRANTS IN SUPPORT OF TEACHING

- 1990-92 NSF grant PHY 89-51582, Instrumentation and Laboratory Improvement Program, *Development of a Quantum Physics Laboratory*. Equipment grant for advanced undergraduate physics laboratory course. (\$18,500 plus equal university matching, for 2.5 years, at Washington State University: Principal Investigator).
- 2021-24 NSF grant PHY 20-50886, REU Site, *The Physics of Waves from the Nanoscale to the Cosmic Scale*, \$347,533; Brian Collins, PI, Gary S. Collins co-PI.

COURSES TAUGHT

A. RUTGERS COLLEGE, NEW BRUNSWICK, NEW JERSEY

Electronics lab for Physics Majors 287-288 (2 yrs); Introductory labs 225-226 (supervisor of four TA's, one year.)

B. CLARK UNIVERSITY, WORCESTER, MASSACHUSETTS

Undergraduate courses: Classical physics (2 yrs), Quantum physics 113 (3), Nuclear Instrumentation Lab 129 (4), Electronics lab 119 (3), Quantum Physics Lab 114 (1).

Graduate courses: Solid state physics 310 (4 yrs), Nuclear Instrum Lab 229 (4), Solid State Spectroscopy 217 (1 yr, cotaught)

C. WASHINGTON STATE UNIVERSITY, PULLMAN, WASHINGTON

Undergraduate courses: Modern physics 303 (2 yrs), Modern physics 304 (9), Quantum physics lab 415 (17 yrs), Classical physics 201 (8), General physics 101 (4), General physics 102 (1) Elect & Mag I 341 (3), Elect & Mag II 342 (2), Thermal Physics 330 (3), Introduction to solid-state and materials physics 463 (1).

Graduate Courses: Quantum physics laboratory 515 (6 yrs), Elect & Mag 541 (2), Electrodynamics 542 (2), Thermal and Statistical Phys I 533 (15), Solid-State Physics 563 (3), Seminar (colloquium) (6), various seminars in solid state physics 593 and 594 (3), Advanced topics 581 (1).

I developed a laboratory course, *Quantum Physics Laboratory*, Phys 415/515, with experiments in modern and quantum physics, that I taught at undergraduate and graduate levels for 17 years.

D. INTERNATIONAL PHD COMMITTEES (4)

E. PHD AND MS STUDENTS ADVISED SINCE 2011 (about 12)**F. UNDERGRADUATE STUDENTS ADVISED SINCE 2014 (about 4)****G. GRADUATE COMMITTEE SERVICE (served on about 60 committees not chaired by me)****UNIVERSITY SERVICE****A. CLARK UNIVERSITY, WORCESTER, MA**

Advisor to physics majors (2 yrs), Colloquium organizer (1), Library Supervisor (2), Radiation safety comm. (2).

B. WASHINGTON STATE UNIVERSITY, PULLMAN, WA

University and College committees. These are the most notable:

Faculty Status Committee: (adjudicates disputes among members of the faculty; elected 1998-2001)

Faculty Affairs Committee: (protects rights of faculty), member 92-95, chair 93-95, member 01-02, 06-10.

Research and Arts Committee (member 88-91, chair 89-90)

Senate ad hoc committee on faculty salaries (co-chaired 2007)

Senate ad hoc committee to investigate apparent fudging of Faculty Senate constitution (11-12)

Departmental committees, including:

Graduate Studies Committee (chooses new graduate students, 18 years, chair for past 6 yrs)

Chaired the local organizing committee for a regional meeting of the American Physical Society in

Moscow/Pullman in May 2004. A great event on the campuses of U Idaho and WSU.

Senator from and for Physics: (12 years in total, from 1988-1994, 2006-09, 2009-12)

SUBSEQUENT POSITIONS OF SELECTED STUDENTS AND ASSOCIATES

(* indicates dissertation or thesis research mentored by Collins)

Ataur Rahman Chowdhury* (Ph.D. 1985, Clark University): Associate Professor of Physics (with tenure), University of Alaska, Fairbanks.

Reinhardt B. Schuhmann* (Ph.D. 1988, Clark University): Managing Editor, Physical Review Letters (2001-).

Steven L. Shropshire* (Ph.D. 1991, Washington State University): Professor of Physics (with tenure), Idaho State University, Pocatello.

Jiawen (Jay) Fan* (Ph.D. 1992, Washington State University): Technical Director, radioisotopes products, North American Scientific, Incorporated, Los Angeles. Opened branch office in Beijing, China, 2005-7.

Praveen Sinha* (Ph.D. 1995, Washington State University): NIH Postdoctoral Research Associate, Dept of Radiation Oncology, University Hospital, University of Wisconsin, Madison to 1997; Developed radiation oncology systems, ADAC Labs, Madison, Wisconsin (1998-2000); Entrepreneur and senior management in companies such as UltraVisual Medical Systems (web-based radiology computing, 2000-03); Thompson Investment Management (2004-); Novashield, Inc (2006-), and Healthmyne (2014-).

Bin Bai* (Ph.D., 1997, Washington State University): Senior Technical Member, Micron Computers, Boise, Idaho (1997-), Located in Micron/Seoul in 2005-6. Established branch offices for Micron in Xi'an, China, and South Korea, 2007- . Engineering and Technical Executive, Micron (2018).

Shing-Jen (Luke) Peng* (Ph.D., 1998, Washington State University); Postdoctoral Associate, Physics, Washington State University (1998-99). Postdoctoral Associate, Gintzon Laboratory, Applied Physics, Stanford University (1999-2000). Research Scientist, Superconductor Technologies, maker of high-T_c devices (2000-06). Principal Process Engineer, PerkinElmer Medical Imaging (now Varex Imaging), Santa Clara (2006-).

Matthew O. Zacate (Ph.D., Oregon State University, 1997); postdoc with Robin Grimes, Imperial College, 1997-99; postdoc at WSU, 1999-2003; Research Assistant Professor, WSU, 2003-2004; Professor (with tenure), Department

of Geology and Physics, Northern Kentucky University, since 2004. Adjunct Professor, WSU.

Farida Selim (Ph.D., Alexandria University); doctoral research at Lawrence Berkeley Laboratory sponsored by Harvard. Postdoc research and teaching at Idaho State University. Postdoc at WSU split between groups of Kelvin Lynn and myself, 2005-7. Instructor, WSU, 2007-9; Research Assistant Professor, Physics, WSU, 2009-13. She and I were PI and co-PI for an NSF grant. Associate Professor (with tenure), Bowling Green Univ., Ohio, 2013-.

John P. Bevington* (Ph.D., 2011, Washington State Univ); Senior Design Engineer, Pentair Flow Technologies (2013-).

Randal Newhouse* (Ph.D., 2012, Washington State University); Assistant Professor of Physics, Portland Community College, Portland, OR.

Ryan Murray* (Ph.D., 2017, Washington State University). Data Scientist, Allstate Insurance, Seattle.

Debashis Banerjee (Ph.D., 2015, Homi Bhabha National Institute); Scientific Officer (permanent), Bhabha Atomic Research Center (BARC), Kolkata, India.

Harmen Thys Nieuwenhuis* (M.S. 1998, University of Groningen): Recipient of MBA degree from Oxford University about 2002. In business in The Netherlands and Singapore.

Egbert Rein Nieuwenhuis* (M.S., Spring 2005, University of Groningen). Completed two MS projects. Returned to the Netherlands and completed studies for an MS degree in physics. Now in business in Amsterdam.

Xiao Wang* (M.S., May 2006, Washington State University). PhD, Biophysics, Rochester, 2013. Model Risk Analyst Intern, Federal Home Loan Bank, Seattle (2014-).

Xia (Sean) Jiang* (M.S. in physics, WSU, May 2008). Graduate study in medical physics at the University of Chicago started Fall 2008. PhD June 2013.

Prastuti Singh (Pullman High School, June 2010). Semifinalist in Intel Science Talent competition 2010 based on research carried out in Collins group during her senior year. Physics BS, California Institute of Technology, May 2014. Also Undergraduate Research Fellow at UC Berkeley in 2013. PhD, Applied Physics, Stanford.

Xiangyu Yin* (MS in Physics, August 2011). Continued PhD physics research at WSU in group of Doerte Blume. Postdoctoral associates at Ohio State University and in Australia; currently assistant editor, Physical Review A, Ridge, NY.

Lee Aspirtarte (REU, summer 2011, BS Physics, August 2011). PhD, physics, Oregon State University, 2017. Postdoc at National Energy Technology Laboratory, Albany, OR.

Qiaoming Wang* (MS Physics, May 2012). Continued in PhD and postdoctoral physics research at WSU in group of Yi Gu; PhD 2016. Currently postdoctoral associate at Southern University of Science and Technology, Shenzhen, Guangzhou.

Kyle Slinker (Pullman High School, June 2006). BS, Physics, University of Washington, 2011; PhD, Astronomy, University of North Carolina, ca 2016.

Ben Norman* (B.S. in physics, Dec 2007, honors thesis defended Oct 2007, Washington State University). PhD, University of Michigan, ca 2014.

Justin Ahn (Pullman High School, June 2008). Northwestern University Fall 2008, graduate BS Business, May 2012.

Megan Lockwood Harberts (REU participant, summer 2008). Physics PhD graduate of Ohio State University in 2015.

Justine Minish (REU participant, summer 2010). Graduated in May 2012 from Alma College, Alma, Michigan, attended graduate school in health science at Oakland University.

Xiangyu Yin* (MS in Physics, August 2011). Continued PhD physics research at WSU in group of Doerte Blume. Postdoctoral associates at Ohio State University and in Australia.

Lee Aspirtarte (REU, summer 2011, BS Physics, WSU, August 2011). PhD, physics, Oregon State University, ca. 2016.

Krystal Kasal* (MS in Physics, June 2015). Postdoctoral trainee on a fellowship in the National Nuclear Safety Administration, Research Scientist, Washington University, St. Louis.

Elyse Waham* (BS in Physics, May 2016). Sales Manager, Fluke Electronics, Everett, WA.

Andrew Bleasdale* (BS in Physics, May 2017). Schweitzer Engineering Laboratory, Pullman, WA.

SELECTED DISSERTATIONS, THESES AND REPORTS (since 2010)

Nuclear relaxation in CoGa₃ lattice structures, Prastuti Singh, report submitted to the competitive high-school *Intel Science Talent Search* 2010, winning an award for her as semifinalist, 17 pages. <http://hdl.handle.net/2376/4191> Technical report 6 of grant NSF DMR 09-04096.

Lattice locations and diffusion in intermetallic compounds explored through PAC measurements and DFT calculations, PhD dissertation, John Paul Bevington, May 2011, 107 pages. <http://hdl.handle.net/2376/4189> Technical report 1 of grant NSF DMR 09-04096.

Indium solubility in α -gallium and gallium-indium eutectic alloys studied using PAC, MS thesis, Xiangyu Yin, May 2011, 51 pages. <http://hdl.handle.net/2376/4188> Technical report 2 of grant NSF DMR 09-04096.

Site preferences and jump frequencies of In/Cd solutes in rare earth palladium phases having the L1₂ structure, MS thesis, Qiaoming Wang, May 2012, 76 pages. <http://hdl.handle.net/2376/4187> Technical report 3 of grant NSF DMR 09-04096.

Atomic jump frequencies in intermetallic compounds studied using perturbing angular correlation of gamma rays, PhD dissertation, Randal Gordon Newhouse, August 2012, 126 pages. <http://hdl.handle.net/2376/4186> Technical report 4 of grant NSF DMR 09-04096.

Geometry of Wigner-Seitz Cells in Intermetallic Compounds and Application to Site Preferences of Indium Impurity Atoms, Benjamin G. McDonald, undergraduate research report, October 2012, 85 pages. <http://hdl.handle.net/2376/4192> Technical report 5 of grant NSF DMR 09-04096.

Investigations of ternary alloys using perturbed angular correlations, Krystal Kasal, MS research report, June 2015, 29 pages. Technical report 1 of grant NSF DMR 14-10159. <https://research.wsulibs.wsu.edu:8443/xmlui/handle/2376/5288>

A qualitative look at the thermodynamics of ternary phase diagrams, Elyse Waham (undergraduate senior thesis, May 2016). Technical Report 2 of grant NSF DMR 14-10159). <http://hdl.handle.net/2376/6258>

Solute-solute interactions in intermetallic compounds studied using perturbed angular correlation of gamma rays, Ryan Murray, PhD dissertation, May 2017. Technical Report 3 of grant NSF DMR 14-10159. <http://hdl.handle.net/2376/12219>

Extending Miedema's semi-empirical model to predict defect site preferences and formation enthalpies in intermetallic compounds, Andrew Bleasdale** (undergraduate senior thesis, December 2016). Technical Report 4 of grant NSF DMR 14-10159. <http://hdl.handle.net/2376/12221>