

CURRICULUM VITAE

NAME: Semen Gorfman, Dr.

FACULTY / DEPARTMENT: Materials Science and Engineering, Faculty of Engineering,
Tel Aviv University, Israel

DATE AND PLACE OF BIRTH: 29 Jan 1979, Chelyabinsk, Russia

DATE OF ARRIVAL IN ISRAEL: 25 Sep 2017

A. EDUCATION:

BSc: Department of Physics, Chelyabinsk State University, Chelyabinsk, Russia. 1996 – 2000

MSc: Department of Physics, Chelyabinsk State University, Chelyabinsk, Russia. 2000 – 2002

PhD: Department of Quantum Chemistry, Mendeleev University of Chemical Technology, Moscow, Russia (2002 - 2003); Department of Physics, University of Potsdam, Potsdam, Germany (2003 – 2005); Department of Physics, University of Siegen, Siegen, Germany (2005 – 2006).

Title of Master's thesis: **Simulation of X-ray diffraction for the analysis of Laue diffraction patterns**

Name of MSc supervisor: Dr I. Sheremetyev

Title of PhD thesis: **Synchrotron X-ray diffraction study of site-selective response in α -GaPO₄ to a permanent external electric field**

Name of PhD supervisors: Prof Dr Vladimir Tsirelson, Prof Dr Ullrich Pietsch

C. ACADEMIC AND PROFESSIONAL EXPERIENCE:

07/2006 – 10/2008: University of Siegen, Germany, Department of Physics, Post-doctoral research assistant.

10/2008 – 10/2011: University of Warwick, Coventry, United Kingdom; Department of Physics, Post-doctoral research assistant.

10/2011 – 10/2016: University of Siegen, Germany, Department of Physics, Lecturer (Akademischer Rat auf Zeit).

10/2016 – 10/2017: University of Freiburg, Germany, Institute of Crystallography, Substitution / Deputy professor (Vertretungsprofessur).

10/2017 – present: Senior Lecturer, Department of Materials Science and Engineering, Faculty of Engineering, Tel Aviv University, Israel

D. ACTIVE PARTICIPATION IN SCIENTIFIC MEETINGS

This list starts from the beginning of my employment in TAU

2017	CECAM Workshop on Ferroelectric Domain walls. Tel Aviv University, Tel Aviv, Israel	Invited talk
2018	UK-Israel Workshop Summer School 2018 on Nano Scale Crystallography for Bio and Materials Research, Tel Aviv, Israel	Invited tutorial lecture
2018	Northwestern University / Tel Aviv University workshop, Evanston, USA	Contributed talk
2018	International Symposium on Applications of Ferroelectric, Hiroshima, Japan	Contributed talk
2018	European Materials Research Society Fall Meeting. Symposium Q. Phase transitions and properties of ferroics in the form of single crystals, ceramics and thin films.	Invited talk
2018	The 18 th Israel Materials Engineering Conference, Leonardo Club Hotel Dead Sea, Israel	Invited talk
2019	International Symposium on Application of Ferroelectrics, Lausanne, Switzerland	Invited talk Contributed talk Session chairing
2019	European Crystallographic Meeting, Vienna, Austria	Organization and chairing of session Contributed talk talk Poster

E. ACADEMIC AND PROFESSIONAL AWARDS

This list starts from the beginning of my employment in TAU

YEAR	FOUNDATION	TITLE	SUM	CO RESEARCHER	PI
2018 – 2022	Israel Science Foundation (ISF)	Fine structure, polarization rotation and low-symmetry phases in ferroelectric perovskites	1100 kNIS		Dr Semen Gorfman

2018 – 2022	Binational US-Israeli Science foundation (BSF)	Local structure mechanisms of electromechanical coupling in oxide ferroelectrics.	\$184,500	Dr Igor Levin (NIST)	Dr Semen Gorfman
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F. MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Associate member of the International Union for Crystallography
- Member of the European Crystallographic Association
- Member of the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society

G. DOCTORAL STUDENTS SUPERVISED BY CANDIDATE

This list starts from the beginning of my employment in TAU

MA/M.Sc. Students

Name of student / Period (years): Mr Uriel Vaknin / 2018 - present

Title of thesis: "Universal algorithm for the prediction of cleavage planes in single crystals"

Name of academic institution: Department of Materials Science and Engineering, Tel Aviv University, Tel Aviv, Israel

Name of student / Period (years): Ms Alla Zinman Felisto / 2017 - present

Title of thesis: "The effect of nano-grain growth on structure and micro-structure in binary systems of Ytria with rare earth oxides ($\text{Re}_x\text{Y}_{2-x}\text{O}_3$) produced using sol-gel method"

Name of academic institution: Department of Materials Science and Engineering, Tel Aviv University, Tel Aviv, Israel

SCIENTIFIC PUBLICATIONS BEFORE JOINING TAU

ORIGINAL ARTICLES

1. I.A. Sheremetyev, S. Gorfman. Number-theoretic method for practical indexing of crystal directions. *Nuclear Instruments and Methods in Physics Research A*, **470** (1-2), pp. 223-227, **2001**.

IF=1.433 (2018), Q1 (Instrumentation)

Citations: GS 1, WOS 1

2. V.G. Tsirelson, S. Gorfman, U. Pietsch. X-ray scattering amplitude of an atom in a permanent external electric field. *Acta Crystallographica A*, **59**, pp. 221-227, **2003**.

IF=1.878 (2018), Q1 (Condensed matter physics)

Citations: GS 18, WOS 14

3. G.M. Rylov, I.A. Sheremetyev, E.N. Fedorova, S. Gorfman, G.N. Kulipanov, N.V. Sobolev NV. Registration and measurement of deformation reorientation in natural diamond lattice by the synchrotron Laue-SR method. *Nuclear Instruments and Methods in Physics Research A, Nuclear Instruments and Methods in Physics Research A*, **543** (1), pp. 131-133, **2005**.

IF=1.433 (2018), Q1 (Instrumentation)

Citations: GS 0, WOS 0

4. S. Gorfman, V. Tsirelson, U. Pietsch U. X-ray diffraction by a crystal in a permanent external electric field: general considerations. *Acta Crystallographica A*, **61**, pp. 387-396, **2005**.

IF=1.878 (2018), Q1 (Condensed matter physics)

Citations: GS 22, WOS 16

5. S. Gorfman, V. Tsirelson, A. Pucher, W. Morgenroth, U. Pietsch. X-ray diffraction by a crystal in a permanent external electric field: electric-field-induced structural response in α -GaPO₄. *Acta Crystallographica A*, **62**, pp. 1-10, **2006**.

IF=1.878 (2018), Q1 (Condensed matter physics)

Citations: GS 26, WOS 19

6. S. Gorfman, O. Schmidt, U. Pietsch, P. Becker, L. Bohaty. X-ray diffraction study of the piezoelectric properties of BiB₃O₆ single crystals. *Zeitschrift für Kristallographie*, **222**, pp. 396-401, **2007**.

IF=1.090 (2018), Q2 (Materials science)

Citations: GS 24, WOS 15

7. O. Schmidt, S. Gorfman, U. Pietsch. Electric-field-induced internal deformation in piezoelectric BiB3O6 crystals. *Crystal Research and Technology*, **43**(11), pp. 1126-1132, **2008**.

Citations: GS 12, WOS 9

IF=1.090 (2018), Q2 (Materials science)

8. O. Schmidt, S. Gorfman, L. Bohaty, E. Neumann, B. Engelen, U. Pietsch. Investigations of the bond-selective response in a piezoelectric Li₂SO₄H₂O crystal to an applied external electric field. *Acta Crystallographica A*, **65**, pp. 267-275, **2009**.

IF=1.878 (2018), Q1 (Condensed matter physics)

Citations: GS 22, WOS 18

9. A. Rutkowska, D. Walker, S. Gorfman, P.A. Thomas, J.V. Macpherson. Horizontal Alignment of Chemical Vapor-Deposited SWNTs on Single-Crystal Quartz Surfaces: Further Evidence for Epitaxial Alignment. *J Phys Chem C*, **113** (39), pp. 17087-17096, **2009**.

IF=4.309 (2018), Q1 (Physical and theoretical chemistry)

Citations: GS 44, WOS 32

10. S. Send, M. Kozierowski, T. Panzner, S. Gorfman, K. Nurdan, A.H. Walenta, U. Pietsch, W. Leitenberger, R. Hartmann, L. Struder. Energy-dispersive Laue diffraction by means of a frame-store pnCCD. *Journal of Applied Crystallography*, **42**, pp. 1139-1146, **2009**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 18, WOS 17

11. K. Datta, S. Gorfman, P.A. Thomas. On the symmetry of the morphotropic phase boundary in ferroelectric BiScO₃-PbTiO₃ system. *Applied Physics Letters*, **95** (25), 1901, **2009**.

IF=3.521 (2018), Q1 (Physics and astronomy)

Citations: GS 27, WOS 18

12. P.A. Thomas, S. Trujillo, M. Boudard, S. Gorfman, J. Kreisel. Diffuse X-ray scattering in the lead-free piezoelectric crystals $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$ and Ba-doped $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$. *Solid State Sciences*, **12**(3), pp. 311-317, **2010**.

IF=2.155 (2018), Q2 (Materials science)

Citations: GS 54, WOS 44

13. S. Gorfman, O. Schmidt, M. Ziolkowski, M. Kodzierowski, U. Pietsch. Time-resolved X-ray diffraction studies of the piezoelectric crystal response to a fast change of an applied electric field. *Journal of Applied Physics*, **108**, 064911, **2010**.

IF=2.328 (2018), Q2 (Physics and Astronomy)

Citations: GS 25, WOS 21

14. S. Gorfman, P.A. Thomas. Evidence for a non-rhombohedral average structure in the lead-free piezoelectric material $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$. *Journal of Applied Crystallography*, **43**, pp. 1409-1414, **2010**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 181, WOS 138

15. S. Gorfman, D.S. Keeble, A.M. Glazer, X. Long, Y. Xie, Z.G. Ye, S. Collins, P.A. Thomas. High-resolution X-ray diffraction study of single crystals of lead zirconate titanate. *Physical Review B*(rapid communications), **84**, 020102R, **2011**.

IF=3.736 (2018), Q1 (Condensed matter physics)

Citations: GS 49, WOS 41

16. S.K.V. Farahani, T.D. Veal, A.M. Sanchez, O. Bierwagen, M.E. White, S. Gorfman, P.A. Thomas, J.S. Speck, C.F. McConville. Influence of charged-dislocation density variations on carrier mobility in heteroepitaxial semiconductors: The case of SnO_2 on sapphire. *Physical Review B*, **86**, 245315, **2012**.

IF=3.736 (2018), Q1 (Condensed matter physics)

Citations: GS 14 WOS 10

17. S. Gorfman, A.M. Glazer, Y. Noguchi, M. Miyayama, H. Luo, P.A. Thomas. Observation of low symmetry phase in Na_{0.5}Bi_{0.5}TiO₃ by optical birefringence microscopy. *Journal of Applied Crystallography*, **45**, pp. 444 – 452, **2012**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 36, WOS 32

18. S. Gorfman, O. Schmidt, V. Tsirelson, M. Ziolkowski, U. Pietsch. Crystallography under external electric field. *Zeit. Anorg. Ang. Chem.*, **639**(11), pp. 1953 – 1962, **2013**.

IF=1.337 (2018), Q3 (Inorganic Chemistry)

Citations: GS 24, WOS 20

19. M. Woll, M. Burianek, D. Klimm, S. Gorfman, M. Mühlberg. Characterization of (Bi_{0.5}Na_{0.5})_{1-x}BaxTiO₃ grown by the TSSG method. *Journal of Crystal Growth*, **401**, pp. 351-354, **2014**.

IF=1.573 (2018), Q2 (Materials chemistry)

Citations: GS 7, WOS 5

20. H. Choe, S. Gorfman, M. Hinterstein, M. Ziolkowski, M. Knapp, S. Heidbrink, M. Vogt, J. Bednarcik, A. Berghäuser, H. Ehrenberg, U. Pietsch. Combining high time and angular resolutions: time-resolved X-ray powder diffraction using a multi-channel analyser detector. *Journal of Applied Crystallography*, **48**, pp. 970 - 974, **2015**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 12, WOS 5

21. S. Gorfman, D.S. Keeble, A. Bombardi, P.A. Thomas. Topology and temperature dependence of the diffuse X-ray scattering in Na_{0.5}Bi_{0.5}TiO₃ ferroelectric single crystals. *Journal of Applied Crystallography*, **48**, pp. 1543 – 1550, **2015**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 18, WOS 14

22. S. Gorfman, H. Choe, V.V. Shvartsman, M. Ziolkowski, M. Vogt, J. Stremper, T. Łukasiewicz, U. Pietsch, J. Dec. Time-resolved X-ray diffraction reveals the hidden

mechanisms of high piezoelectric activity in uniaxial ferroelectric. *Physical Review Letters*, **114**, 097601, **2015**.

IF=9.227 (2018), Q1 (Physics and astronomy)

Citations: GS 12, WOS 9

23. S. Gorfman, H. Simons, T. Iamsasri, S. Prasertpalichat, D.P. Cann, H. Choe, U. Pietsch, Y. Watier, J.L. Jones. Simultaneous resonant X-ray diffraction measurement of polarization inversion and lattice strain in polycrystalline ferroelectrics. *Scientific Reports*, **6**, 20829, **2016**.

IF=4.011 (2018), Q1 (Multidisciplinary)

Citations: GS 18, WOS 13

24. D. Walker, A.M. Glazer, S. Gorfman, J. Baruchel, P. Pernot, R.T. Kluender, F. Masiello, C. DeVreugd, P.A. Thomas. X-ray white beam topography of self-organized domains in flux-grown BaTiO₃ single crystals. *Physical Review B*, **94**, 024110, **2016**.

IF=3.736 (2018), Q1 (Condensed matter physics)

Citations: GS 2, WOS 2

25. T. Vergentev, I. Bronwald, D. Chernyshov, S. Gorfman, S.H.M. Ryding, P. Thompson, R.J. Cernik. A rapid 2D data collection system for the study of ferroelectric materials under external applied electric fields. *Journal of Applied Crystallography*, **49**(5), pp. 1501-1507, **2016**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 8, WOS 5

26. B. Khanbabaee, E. Mehner, C. Richter, J. Hanzig, M. Zschornak, U. Pietsch, H. Stöcker, T. Leisegang, D.C. Meyer, S. Gorfman. Large piezoelectricity in electric-field modified single crystals of SrTiO₃. *Applied Physics Letters*, **109**, 222901, **2016**.

IF=3.521 (2018), Q1 (Physics and Astronomy)

Citations: GS 13, WOS 10

27. H. Choe, S. Gorfman, S. Heidbrink, U. Pietsch, M. Vogt, J. Winter, M. Ziolkowski Multi-Channel FPGA-Based Data-Acquisition-System for Time-Resolved Synchrotron Radiation Experiments. *IEEE Transactions on Nuclear Science*, **64**(6), **2016**. 1320 – 1326.

IF=1.428 (2018), Q2 (Electrical and electronic engineering)

Citations: GS 10, WOS 7

SHARED AFFILIATION

28. H. Choe, S. Heidbrink, M. Ziolkowski, U. Pietsch, V. Dyadkin, S. Gorfman, D. Chernyshov. A microcontroller for in situ single-crystal diffraction measurements with a PILATUS-2M detector under an alternating electric field. *Journal of Applied Crystallography*. **50**(3), 975-977, **2017**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 4, WOS 3

SCIENTIFIC PUBLICATIONS WITH only TAU AFFILIATION

29. T. Iamsasri, G. Esteves, H. Choe, M. Vogt, S. Prasertpalichat, D. P. Cann, S. Gorfman, J. L. Jones. Time and frequency-dependence of the electric field-induced phase transition in $\text{BaTiO}_3\text{-BiZn}_{1/2}\text{Ti}_{1/2}\text{O}_3$. *Journal of Applied Physics*, **122**(6), 064104, **2017**.

IF=2.328 (2018), Q2 (Physics and Astronomy)

Citations: GS 4, WOS 4

30. G.D.L. Flor, T. Malcherek, S. Gorfman, B. Mihailova. Structural transformations in $(1-x)\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3 - x \text{BaTiO}_3$ single crystals studied by Raman spectroscopy. *Physical Review B*, **96**, 214102, **2017**.

IF=3.736 (2018), Q1 (Condensed matter physics)

Citations: GS 10, WOS 6

31. N. Zhang, H. Yokota, A.M. Glazer, D.A. Keen, S. Gorfman, P.A. Thomas, W. Ren, Z.-G. Ye. Local-scale structures across the morphotropic phase boundary in $\text{PbZr}_{1-x}\text{Ti}_x\text{O}_3$. *IUCrJ*, **5**(1), **2018**.

IF=4.756 (2018), Q1 (Condensed matter physics)

Citations: GS 6, WOS 6

32. C. Richter, M. Zschornak, D. Novikov, E. Mehner, M. Nentwich, J. Hanzig, S. Gorfman, D. C. Meyer. Picometer polar atomic displacements in strontium titanate determined by resonant X-ray diffraction. *Nature Communications*, 9 (1), 178, **2018**.

IF=11.878 (2018), Q1 (Multidisciplinary)

Citations: GS 7, WOS 7

33. H. Choe, J. Bieker, N. Zhang, A. M. Glazer, P.A. Thomas, S. Gorfman. Monoclinic distortion, polarization rotation and piezoelectricity in the ferroelectric $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$. *IUCrJ*, 5(4), **2018**.

IF=4.756 (2018), Q1 (Condensed matter physics)

Citations: GS 2, WOS 2

34. S. Gorfman, A.A. Bokov, A. Davtyan, M. Reiser, Y. Xie, Z.-G. Ye, A. V. Zozulya, M. Sprung, U. Pietsch, and C. Gutt. Ferroelectric domain wall dynamics characterized with X-ray photon correlation spectroscopy. *PNAS*, 201720991, **2018**.

IF=9.580 (2018), Q1 (Multidisciplinary)

Citations: GS 1, WOS 1

35. N. Zhang, S. Gorfman, H. Choe, T. Vergentev, V. Dyadkin, H. Yokota, D. Chernyshov, B. Wang, A.M. Glazer, W. Ren, Z.-G. Ye. Probing the intrinsic and extrinsic origins of piezoelectricity in lead zirconate titanate single crystals. *Journal of Applied Crystallography*. 51(5), 1396 – 1403, **2018**.

IF=3.161 (2018), Q1 (Biochemistry, genetics and molecular biology)

Citations: GS 0, WOS 0

36. G De La Flor, S. Gorfman, B Mihailova. Local-scale structural response of $(1-x)\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3-x\text{BaTiO}_3$ to external electric fields. *Applied Physics Letters*. 114(4), 042901, **2019**.

IF=3.521 (2018), Q1 (Physics and Astronomy)

Citations: GS 1, WOS 1

37. M. Angst, S. Adiga, S. Gorfman, M. Ziolkowski, J. Stempfer, C. Grams, M. Pietsch, J. Hemberger. Intrinsic Ferroelectricity in Charge-Ordered Magnetite. *Crystals*. 9(11), 546, **2019**.

IF=2.144 (2019), Q2 (Materials Science)

Citations: GS 1, WOS 0

Review papers and book chapters

R1. Gorfman S. Sub-microsecond X-ray crystallography: technique, challenges and applications for materials science. *Crystallography Reviews*, 20(3), pp. 210-232, **2014**.

IF=3.067 (2017), Q1 (Materials Science)

Citations: GS 26, WOS 25