# Sergei Dudarev

List of Publications by Year
in descending order



| 115 | 18,354 | 53794 45 | 22166 113 |
|---|---|---|---|
| papers | citations | h-index | g-index |

| 116 | 116 | 116 | 17711 |
|---|---|---|---|
| all docs | docs citations | times ranked | citing authors |

| # | Article | IF | Citations |
|---|---|---|---|
| 1 | Comparative study of deuterium retention and vacancy content of self-ion irradiated tungsten. Journal of Nuclear Materials, 2022, 558, 153373. | 2.7 | 16 |
| 2 | Materials for in-vessel components. Fusion Engineering and Design, 2022, 174, 112994. | 1.9 | 23 |
| 3 | Dislocation dynamics simulation of thermal annealing of a dislocation loop microstructure. Journal of Nuclear Materials, 2022, 562, 153552. | 2.7 | 11 |
| 4 | Volume of a dislocation network. Physical Review Materials, 2022, 6, . | 2.4 | 3 |
| 5 | Discrete stochastic model of point defect-dislocation interaction for simulating dislocation climb. International Journal of Plasticity, 2021, 136, 102848. | 8.8 | 24 |
| 6 | Elastic dipole tensors and relaxation volumes of point defects in concentrated random magnetic Fe-Cr alloys. Computational Materials Science, 2021, 194, 110435. | 3.0 | 24 |
| 7 | First-principles model for voids decorated by transmutation solutes: Short-range order effects and application to neutron irradiated tungsten. Physical Review Materials, 2021, 5, . | 2.4 | 7 |
| 8 | Elastic dipole tensor of a defect at a finite temperature: Definition and properties. Physical Review Materials, 2021, 5, . | 2.4 | 2 |
| 9 | Multiscale modelling for fusion and fission materials: The M4F project. Nuclear Materials and Energy, 2021, 29, 101051. | 1.3 | 12 |
| 10 | Parameter-free quantitative simulation of high-dose microstructure and hydrogen retention in ion-irradiated tungsten. Physical Review Materials, 2021, 5, . | 2.4 | 26 |
| 11 | Perspectives on multiscale modelling and experiments to accelerate materials development for fusion. Journal of Nuclear Materials, 2021, 554, 153113. | 2.7 | 37 |
| 12 | Nonuniversal structure of point defects in face-centered cubic metals. Physical Review Materials, 2021, 5, . | 2.4 | 14 |
| 13 | Microstructural complexity and dimensional changes in heavily irradiated zirconium. Physical Review Materials, 2021, 5, . | 2.4 | 5 |
| 14 | CALANIE: Anisotropic elastic correction to the total energy, to mitigate the effect of periodic boundary conditions. Computer Physics Communications, 2020, 252, 107130. | 7.5 | 13 |
| 15 | Observation of Transient and Asymptotic Driven Structural States of Tungsten Exposed to Radiation. Physical Review Letters, 2020, 125, 225503. | 7.8 | 38 |
| 16 | Quantum de-trapping and transport of heavy defects in tungsten. Nature Materials, 2020, 19, 508-511. | 27.5 | 20 |
| 17 | Atomistic Spin-Lattice Dynamics. , 2020, , 1017-1035. | | 2 |
| 18 | Microscopic structure of a heavily irradiated material. Physical Review Materials, 2020, 4, . | 2.4 | 45 |

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| 19 | Multiscale analysis of dislocation loops and voids in tungsten. Physical Review Materials, 2020, 4, . | 2.4 | 17 |
| 20 | Ultraviolet catastrophe of a fluctuating curved dislocation line. Physical Review Research, 2020, 2, . | 3.6 | 8 |
| 21 | Statistical mechanics of kinks on a gliding screw dislocation. Physical Review Research, 2020, 2, . | 3.6 | 2 |
| 22 | Relaxation volumes of microscopic and mesoscopic irradiation-induced defects in tungsten. Journal of Applied Physics, 2019, 126, . | 2.5 | 35 |
| 23 | The microscopic Einstein-de Haas effect. Journal of Chemical Physics, 2019, 150, 224109. | 3.0 | 4 |
| 24 | Atomistic-object kinetic Monte Carlo simulations of irradiation damage in tungsten. Modelling and Simulation in Materials Science and Engineering, 2019, 27, 055003. | 2.0 | 15 |
| 25 | Dynamics of magnetism in Fe-Cr alloys with Cr clustering. Physical Review B, 2019, 99, . | 3.2 | 16 |
| 26 | European materials development: Results and perspective. Fusion Engineering and Design, 2019, 146, 1300-1307. | 1.9 | 50 |
| 27 | Universality of point defect structure in body-centered cubic metals. Physical Review Materials, 2019, 3, . | 2.4 | 53 |
| 28 | Symmetry-broken self-interstitial defects in chromium, molybdenum, and tungsten. Physical Review Materials, 2019, 3, . | 2.4 | 28 |
| 29 | Effect of stress on vacancy formation and migration in body-centered-cubic metals. Physical Review Materials, 2019, 3, . | 2.4 | 31 |
| 30 | Diffusion and interaction of prismatic dislocation loops simulated by stochastic discrete dislocation dynamics. Physical Review Materials, 2019, 3, . | 2.4 | 20 |
| 31 | Parametrization of <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:mi>LSDA</mml:mi><mml:mo>+</mml:mo><mml:mi>U</mml:mi></mml:mrow></mml:math> for noncollinear magnetic configurations: Multipolar magnetism in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mi>UO</mml:mi><mml:mn>2</mml:mn></mml:msub></mml:math> Physical Review Materials, 2019, 3, . | 2.4 | 35 |
| 32 | Continuum model for the core of a straight mixed dislocation. Physical Review Materials, 2019, 3, . | 2.4 | 5 |
| 33 | Improving atomic displacement and replacement calculations with physically realistic damage models. Nature Communications, 2018, 9, 1084. | 12.8 | 241 |
| 34 | Multiscale modelling of the interaction of hydrogen with interstitial defects and dislocations in BCC tungsten. Nuclear Fusion, 2018, 58, 016006. | 3.5 | 40 |
| 35 | Direct observation of the spatial distribution of primary cascade damage in tungsten. Acta Materialia, 2018, 144, 905-917. | 7.9 | 33 |
| 36 | Atomistic Spin-Lattice Dynamics. , 2018, , 1-19. | | 0 |

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| 37 | Statistical model for diffusion-mediated recovery of dislocation and point-defect microstructure. Physical Review E, 2018, 98, . | 2.1 | 8 |
| 38 | Primary radiation damage: A review of current understanding and models. Journal of Nuclear Materials, 2018, 512, 450-479. | 2.7 | 358 |
| 39 | Experimental observation of the number of visible defects produced in individual primary damage cascades in irradiated tungsten. Europhysics Letters, 2018, 122, 66001. | 2.0 | 10 |
| 40 | A multi-scale model for stresses, strains and swelling of reactor components under irradiation. Nuclear Fusion, 2018, 58, 126002. | 3.5 | 61 |
| 41 | Elastic fields, dipole tensors, and interaction between self-interstitial atom defects in bcc transition metals. Physical Review Materials, 2018, 2, . | 2.4 | 47 |
| 42 | Kink-limited Orowan strengthening explains the brittle to ductile transition of irradiated and unirradiated bcc metals. Physical Review Materials, 2018, 2, . | 2.4 | 9 |
| 43 | Atomistic-to-continuum description of edge dislocation core: Unification of the Peierls-Nabarro model with linear elasticity. Physical Review Materials, 2018, 2, . | 2.4 | 14 |
| 44 | A first-principles model for anomalous segregation in dilute ternary tungsten-rhenium-vacancy alloys. Journal of Physics Condensed Matter, 2017, 29, 145403. | 1.8 | 49 |
| 45 | Spatial heterogeneity of tungsten transmutation in a fusion device. Nuclear Fusion, 2017, 57, 044002. | 3.5 | 31 |
| 46 | Recent advances in modeling and simulation of the exposure and response of tungsten to fusion energy conditions. Nuclear Fusion, 2017, 57, 092008. | 3.5 | 113 |
| 47 | Non-local model for diffusion-mediated dislocation climb and cavity growth. Journal of the Mechanics and Physics of Solids, 2017, 103, 121-141. | 4.8 | 19 |
| 48 | Elastic interactions between nano-scale defects in irradiated materials. Acta Materialia, 2017, 125, 425-430. | 7.9 | 43 |
| 49 | Low temperature diffusivity of self-interstitial defects in tungsten. New Journal of Physics, 2017, 19, 073024. | 2.9 | 45 |
| 50 | Dynamic simulation of structural phase transitions in magnetic iron. Physical Review B, 2017, 96, . | 3.2 | 36 |
| 51 | Cascade fragmentation: deviation from power law in primary radiation damage. Materials Research Letters, 2017, 5, 357-363. | 8.7 | 56 |
| 52 | Hydrogen accumulation around dislocation loops and edge dislocations: from atomistic to mesoscopic scales in BCC tungsten. Physica Scripta, 2017, T170, 014073. | 2.5 | 15 |
| 53 | Ab initioscaling laws for the formation energy of nanosized interstitial defect clusters in iron, tungsten, and vanadium. Physical Review B, 2016, 94, . | 3.2 | 84 |
| 54 | Subcascade formation and defect cluster size scaling in high-energy collision events in metals. Europhysics Letters, 2016, 115, 26001. | 2.0 | 38 |

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| 55 | Fast, vacancy-free climb of prismatic dislocation loops in bcc metals. Scientific Reports, 2016, 6, 30596. | 3.3 | 56 |
| 56 | SPILADY: A parallel CPU and GPU code for spinâ€“lattice magnetic molecular dynamics simulations. Computer Physics Communications, 2016, 207, 350-361. | 7.5 | 29 |
| 57 | Hubbard-like Hamiltonians for interacting electrons in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>s</mml:mi><mml:mo>,</mml:mo><mml:mi>p</mml:mi></mml:math>, and<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>d</mml:mi></mml:math>orbitals. Physical Review B, 2016, 93, . | 3.2 | 26 |
| 58 | Phonon drag force acting on a mobile crystal defect: Full treatment of discreteness and nonlinearity. Physical Review B, 2015, 92, . | 3.2 | 35 |
| 59 | Non-Contact Measurement of Thermal Diffusivity in Ion-Implanted Nuclear Materials. Scientific Reports, 2015, 5, 16042. | 3.3 | 78 |
| 60 | Direct observation of size scaling and elastic interaction between nano-scale defects in collision cascades. Europhysics Letters, 2015, 110, 36001. | 2.0 | 102 |
| 61 | Phase stability of ternary fcc and bcc Fe-Cr-Ni alloys. Physical Review B, 2015, 91, . | 3.2 | 114 |
| 62 | Lattice swelling and modulus change in a helium-implanted tungsten alloy: X-ray micro-diffraction, surface acoustic wave measurements, and multiscale modelling. Acta Materialia, 2015, 89, 352-363. | 7.9 | 123 |
| 63 | Constrained density functional for noncollinear magnetism. Physical Review B, 2015, 91, . | 3.2 | 68 |
| 64 | Trapping of He clusters by inert-gas impurities in tungsten: First-principles predictions and experimental validation. Nuclear Instruments & Methods in Physics Research B, 2015, 352, 86-91. | 1.4 | 45 |
| 65 | Elastic trapping of dislocation loops in cascades in ion-irradiated tungsten foils. Journal of Physics Condensed Matter, 2014, 26, 375701. | 1.8 | 111 |
| 66 | Spatial ordering of nano-dislocation loops in ion-irradiated materials. Journal of Nuclear Materials, 2014, 455, 16-20. | 2.7 | 58 |
| 67 | Classical Mobility of Highly Mobile Crystal Defects. Physical Review Letters, 2014, 113, 215501. | 7.8 | 20 |
| 68 | Radiation damage production in massive cascades initiated by fusion neutrons in tungsten. Journal of Nuclear Materials, 2014, 455, 207-211. | 2.7 | 79 |
| 69 | Developing structural, high-heat flux and plasma facing materials for a near-term DEMO fusion power plant: The EU assessment. Journal of Nuclear Materials, 2014, 455, 277-291. | 2.7 | 210 |
| 70 | Lambda transitions in materials science: Recent advances in CALPHAD and firstâ€principles modelling. Physica Status Solidi (B): Basic Research, 2014, 251, 53-80. | 1.5 | 75 |
| 71 | Comparative Assessment of Material Performance in DEMO Fusion Reactors. Fusion Science and Technology, 2014, 66, 9-17. | 1.1 | 16 |
| 72 | Density Functional Theory Models for Radiation Damage. Annual Review of Materials Research, 2013, 43, 35-61. | 9.3 | 101 |

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| 73 | Neutron-induced dpa, transmutations, gas production, and helium embrittlement of fusion materials. Journal of Nuclear Materials, 2013, 442, S755-S760. | 2.7 | 122 |
| 74 | Theory and simulation of the diffusion of kinks on dislocations in bcc metals. Physical Review B, 2013, 87, . | 3.2 | 62 |
| 75 | Recent progress in research on tungsten materials for nuclear fusion applications in Europe. Journal of Nuclear Materials, 2013, 432, 482-500. | 2.7 | 610 |
| 76 | Interatomic potentials for modelling radiation defects and dislocations in tungsten. Journal of Physics Condensed Matter, 2013, 25, 395502. | 1.8 | 192 |
| 77 | High-energy collision cascades in tungsten: Dislocation loops structure and clustering scaling laws. Europhysics Letters, 2013, 103, 46003. | 2.0 | 174 |
| 78 | Spin-lattice dynamics model for magnon-phonon-electron heat transfer on a million atom scale. Journal of Applied Physics, 2012, 111, 07D114. | 2.5 | 6 |
| 79 | An integrated model for materials in a fusion power plant: transmutation, gas production, and helium embrittlement under neutron irradiation. Nuclear Fusion, 2012, 52, 083019. | 3.5 | 228 |
| 80 | First-principles models for phase stability and radiation defects in structural materials for future fusion power-plant applications. Journal of Materials Science, 2012, 47, 7385-7398. | 3.7 | 26 |
| 81 | Spin-lattice-electron dynamics simulations of magnetic materials. Physical Review B, 2012, 85, . | 3.2 | 54 |
| 82 | Phase stability, point defects, and elastic properties of W-V and W-Ta alloys. Physical Review B, 2011, 84, . | 3.2 | 139 |
| 83 | Simulating dislocation loop internal dynamics and collective diffusion using stochastic differential equations. Physical Review B, 2011, 84, . | 3.2 | 34 |
| 84 | Optimization of the magnetic potential for Î±-Fe. Journal of Physics Condensed Matter, 2011, 23, 206001. | 1.8 | 40 |
| 85 | Review on the EFDA programme on tungsten materials technology and science. Journal of Nuclear Materials, 2011, 417, 463-467. | 2.7 | 157 |
| 86 | Ab initiomulti-string Frenkelâ€“Kontorova model for a b =a/2[111] screw dislocation in bcc iron. Philosophical Magazine, 2010, 90, 1035-1061. | 1.6 | 22 |
| 87 | Langevin model for real-time Brownian dynamics of interacting nanodefects in irradiated metals. Physical Review B, 2010, 81, . | 3.2 | 65 |
| 88 | Magnetic cluster expansion model for bcc-fcc transitions in Fe and Fe-Cr alloys. Physical Review B, 2010, 81, . | 3.2 | 111 |
| 89 | High-temperature dynamics of surface magnetism in iron thin films. Philosophical Magazine, 2009, 89, 2921-2933. | 1.6 | 23 |
| 90 | Magnetic cluster expansion simulations of FeCr alloys. Journal of Nuclear Materials, 2009, 386-388, 22-25. | 2.7 | 43 |

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| 91 | The EU programme for modelling radiation effects in fusion reactor materials: An overview of recent advances and future goals. Journal of Nuclear Materials, 2009, 386-388, 1-7. | 2.7 | 68 |
| 92 | Model many-body Stoner Hamiltonian for binary FeCr alloys. Physical Review B, 2009, 80, . | 3.2 | 29 |
| 93 | The non-degenerate core structure of a Â½âŸ¨111âŸ© screw dislocation in bcc transition metals modelled using Finnisâ€“Sinclair potentials: The necessary and sufficient conditions. Philosophical Magazine, 2009, 89, 3235-3243. | 1.6 | 27 |
| 94 | The non-Arrhenius migration of interstitial defects in bcc transition metals. Comptes Rendus Physique, 2008, 9, 409-417. | 0.9 | 52 |
| 95 | The Feâ€“Cr system: atomistic modelling of thermodynamics and kinetics of phase transformations. Comptes Rendus Physique, 2008, 9, 379-388. | 0.9 | 60 |
| 96 | Effect of the<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mi>Î±</mml:mi><mml:mo>â^¼</mml:mo><mml:mi>Î³</mml:mi></mml:math>Phase Transition on the Stability of Dislocation Loops in bcc Iron. Physical Review Letters, 2008, 100, 135503. | 7.8 | 187 |
| 97 | Structure and metastability of mesoscopic vacancy and interstitial loop defects in iron and tungsten. Journal of Physics Condensed Matter, 2008, 20, 345214. | 1.8 | 78 |
| 98 | Spin-Lattice Dynamics Simulations of Ferromagnetic Iron. AIP Conference Proceedings, 2008, , . | 0.4 | 4 |
| 99 | Large-scale simulation of the spin-lattice dynamics in ferromagnetic iron. Physical Review B, 2008, 78, . | 3.2 | 138 |
| 100 | Monte Carlo study of thermodynamic properties and clustering in the bcc Fe-Cr system. Physical Review B, 2007, 75, . | 3.2 | 121 |
| 101 | Driven mobility of self-interstitial defects under electron irradiation. Nuclear Instruments & Methods in Physics Research B, 2007, 256, 253-259. | 1.4 | 20 |
| 102 | Systematic group-specific trends for point defects in bcc transition metals: An ab initio study. Journal of Nuclear Materials, 2007, 367-370, 257-262. | 2.7 | 35 |
| 103 | Multiscale modeling of crowdion and vacancy defects in body-centered-cubic transition metals. Physical Review B, 2007, 76, . | 3.2 | 396 |
| 104 | Interatomic potentials for materials with interacting electrons. Journal of Computer-Aided Materials Design, 2007, 14, 129-140. | 0.7 | 28 |
| 105 | Magnetic origin of nano-clustering and point defect interaction in Feâ€“Cr alloys: an ab-initio study. Journal of Computer-Aided Materials Design, 2007, 14, 159-169. | 0.7 | 39 |
| 106 | Self-interstitial atom defects in bcc transition metals: Group-specific trends. Physical Review B, 2006, 73, . | 3.2 | 360 |
| 107 | Simulations of weak-beam diffraction contrast images of dislocation loops by the many-beam Howieâ€“Basinski equations. Philosophical Magazine, 2006, 86, 4851-4881. | 1.6 | 36 |
| 108 | Effects of elastic interactions on post-cascade radiation damage evolution in kinetic Monte Carlo simulations. Philosophical Magazine, 2005, 85, 661-675. | 1.6 | 38 |

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| 109 | Heterogeneous void swelling near grain boundaries in irradiated materials. Physical Review B, 2003, 67, . | 3.2 | 27 |
| 110 | Coherent motion of interstitial defects in a crystalline material. Philosophical Magazine, 2003, 83, 3577-3597. | 1.6 | 78 |
| 111 | Understanding STM images and EELS spectra of oxides with strongly correlated electrons: a comparison of nickel and uranium oxides. Micron, 2000, 31, 363-372. | 2.2 | 96 |
| 112 | Electron-energy-loss spectra and the structural stability of nickel oxide:â€,â€,An LSDA+U study. Physical Review B, 1998, 57, 1505-1509. | 3.2 | 10,657 |
| 113 | Surface structure and bonding in the strongly correlated metal oxides NiO and UO2. Journal of Vacuum Science and Technology A: Vacuum, Surfaces and Films, 1998, 16, 1055-1058. | 2.1 | 44 |
| 114 | Effect of Mott-Hubbard correlations on the electronic structure and structural stability of uranium dioxide. The Philosophical Magazine: Physics of Condensed Matter B, Statistical Mechanics, Electronic, Optical and Magnetic Properties, 1997, 75, 613-628. | 0.6 | 278 |
| 115 | Macroscopic elastic stress and strain produced by irradiation. Nuclear Fusion, 0, , . | 3.5 | 11 |