Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

Khaled E. El-Kelany

Kafrelsheikh university

Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Criterion 5 (original contributions of major significance). It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

727	859	56	15
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

78.5% independent of 340 classified citing papers

Citation type	Count
Independent	267
Self-citation	14
Co-author	59
Same-institution	0

387 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

Claim — Contribution 1

The researcher established a foundational ab initio framework for describing piezoelectricity in SrTiO3, subsequently extending this methodology to characterize the low-temperature phase properties of BaTiO3.

The researcher's core contribution rests on the 2013 paper 'Piezoelectricity of SrTiO: An ab initio description,' which appears to provide a fundamental theoretical description of piezoelectric behavior in strontium titanate using first-principles calculations. This work serves as the anchor for a broader line of inquiry into functional oxide materials.

Originality in this line of work is suggested by the chronological progression from the core SrTiO3 study to follow-up research on barium titanate. The 2014 publications indicate an expansion of the ab initio approach to comprehensively model the piezoelectric, dielectric, elastic, and photoelastic properties of BaTiO3 in its low-temperature phase, addressing the need for detailed theoretical characterization of these complex material states.

The significance of this research is evidenced by substantial citation activity. The core paper has accumulated 134 citations, while the follow-up studies have garnered 95 citations each. Notably, 82.1% of the citing papers originate from independent researchers, indicating that this theoretical framework has been widely adopted and utilized by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 118

CORE PAPER

Piezoelectricity of SrTiO: An ab initio description

2013 · Physical Review B—Condensed Matter and Materials Physics 88 (3), 035102, 2013 · 134 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Piezoelectric effect polyvinylidene fluoride (PVDF): from energy harvester to smart skin and electronic textiles	University of Shanghai for Science and Technology	China	—
2	Perspectives on electron transfer kinetics across graphene-family nanomaterials and interplay of electronic structure with defects and quantum capacitance	—	—	—
3	Quantum critical electro-optic and piezo-electric nonlinearities	Stanford University, University of Chicago	United States	—
4	Stabilizing high-voltage performance of nickel-rich cathodes via facile solvothermally synthesized niobium-doped strontium titanate	The University of New South Wales, University of New South Wales	Australia	—
5	Domains within Domains and Walls within Walls: Evidence for Polar Domains <?format ?>in Cryogenic	University of Cambridge	United Kingdom	—
6	Dual-modification of Ni-rich cathode materials through strontium titanate coating and thermal treatment	The University of New South Wales, University of New South Wales, University of Technology Sydney	Australia	—
7	Ultraviolet light-driven degradation of organic dyes using SrTiO3 photocatalytic nanoparticles	Shivaji University	India	—

No.	Citing paper	Citing institution(s)	Country	S2
8	Enhancing the electrochemical properties of nickel-rich cathode by surface coating with defect-rich strontium titanate	The University of New South Wales, University of New South Wales	Australia	—
9	Ag-doped SrTiO3: Enhanced water splitting for hydrogen production	Universidade Estadual Paulista	Brazil	—
10	Birnessite: a layered manganese oxide to capture sunlight for water-splitting catalysis	—	—	—
11	First-principle calculations to investigate structural, electronic, optical, thermodynamic, and thermoelectric properties of ABO3 (A=Cs, Rb and B= Ta, Nb) compounds	—	—	—
12	Strain-Induced Optimization of Nanoelectromechanical Energy Harvesting and Nanopiezotronic Response in a MoS2 Monolayer Nanosheet	—	—	—
13	Slow magnetic relaxation of Dy adatoms with in-plane magnetic anisotropy on a two-dimensional electron gas	Ecole Polytechnique Fédérale de Lausanne, ETH Zurich	Switzerland	—
14	Ab initio calculations of structural, electronic and vibrational properties of BaTiO3 and SrTiO3 perovskite crystals with oxygen vacancies	University of Latvia	Latvia	—
15	Pyroelectric Effect in Tetragonal Ferroelectrics BaTiO3 and KNbO3 Studied with Density Functional Theory	—	—	—
16	Ag Cluster-Modified K0.5Na0.5NbO3 Piezocatalyst for Enhanced Electrochemical Dinitrogen Reduction Reaction	—	—	—
17	Influence of the oxygen vacancy and Ag-doping on the magnetic and electronic properties of the SrFeO3 material	Universidade Estadual de Ponta Grossa	Brazil	—
18	Magnetic and electric polar regions in the magnetoelectric composite microstructure	—	—	—
19	Elastic and piezoelectric properties of β-glycine–a quantum crystallography view on intermolecular interactions and a high-pressure phase transition	—	—	—
20	Influence of nonlocal elasticity tensor and flexoelectricity in a rod: An asymptotic homogenization approach	Universidade Federal Fluminense, University of Central Florida	Brazil, United States	—
21	Pyroelectricity in Ferroelectric PbTiO3 Enhanced by A-Site Cation Contribution and Negative Thermal Expansion	—	—	—
22	A thorough investigation of electronic, optical, mechanical, and thermodynamic properties of stable glasslike sodium germanate under compressive hydrostatic ...	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
23	O2 Activation over Ag-Decorated CeO2(111) and TiO2(110) Surfaces: A Theoretical Comparative Investigation	—	—	—
24	Electronic, mechanical and piezoelectric properties of glass-like complex Na 2 Si 1− x Ge x O 3 (x= 0.0, 0.25, 0.50, 0.75, 1.0)	Mizoram University, Universidade Estadual Paulista, Universidade Federal do Rio Grande do Norte	Brazil, India	—
25	Computational screening of piezoelectric constants in metal–organic frameworks: design principles and ferroelectric-like bond modulation	Delft University of Technology	Netherlands	—
26	Acoustic and thermodynamic properties of cesium niobate under pressure and temperature: a DFT study	Begum Rokeya University, University of Tsukuba	Bangladesh, Japan	—
27	Giant piezoelectricity driven by Thouless pump in conjugated polymers	Massachusetts Institute of Technology	United States	—
28	Spin density in : I. Joint refinement of polarized neutron diffraction and magnetic x-ray diffraction data leading to insights into orbital ordering	Oak Ridge National Laboratory	United States	—
29	A systematic evaluation of the role of lanthanide elements in functional complex oxides; implications for energy conversion devices	Kyushu University, Tokyo Institute of Technology	Japan	—
30	Multifunctional Janus Mo2SSeO Monolayer with Room Temperature Altermagnetism, High Thermoelectric Efficiency, and Strain Tunable Valley Polarization	King Khalid University, Northern Border University, Qassim University	Pakistan, Saudi Arabia	—

Showing the 30 most-cited of 72 independent citing papers.

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

FOLLOW-UP WORK

Low-temperature phase of BaTiO: Piezoelectric, dielectric, elastic, and photoelastic properties from ab initio simulations

2014 · 95 citations (GS)

No independent citing papers resolved for this paper in the current crawl.

FOLLOW-UP WORK

Low-temperature phase of BaTiO: Piezoelectric, dielectric, elastic, and photoelastic properties from ab initio simulations

2014 · Physical Review B 89 (4), 045103, 2014 · 95 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Strain-Induced Optimization of Nano-electromechanical Energy Harvesting and	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
	Nanopiezotronic Response in a MoS2 Monolayer Nanosheet			
2	Ab initio calculations of structural, electronic and vibrational properties of BaTiO3 and SrTiO3 perovskite crystals with oxygen vacancies	University of Latvia	Latvia	—
3	Interface-induced enhancement of piezoelectricity in the (SrTiO 3) m/(BaTiO 3) M– m superlattice for energy harvesting applications	—	—	—
4	Manifestation of dipole-induced disorder in self-assembly of ferroelectric and ferromagnetic nanocubes	—	—	—
5	Microscopic origin of piezoelectricity in lead-free halide perovskite: application in nanogenerator design	—	—	—
6	Understanding the role of Hubbard corrections in the rhombohedral phase of	École Polytechnique Fédérale de Lausanne, Rutgers, The State University of New Jersey, University of Bremen	Germany, Ghana, Switzerland	—
7	Topological phonons in oxide perovskites controlled by light	Institute of Science Tokyo, University of Cambridge	Japan, United Kingdom	—
8	Li and Na adsorption on graphene and graphene oxide examined by density functional theory, quantum theory of atoms in molecules, and electron …	The University of Texas Rio Grande Valley	United States	—
9	Temperature-dependent Raman spectroscopy, domain morphology and photoluminescence studies in lead-free BCZT ceramic	Central University of Rajasthan, Institute of Physics, University of Aveiro	India, Portugal, Russia	—
10	The First Alkaline-Earth Fluorooxoborate Ba[B4O6F2]—Characterisation and Doping with Eu2+	—	—	—
11	Experimental and theoretical perspective on band gap modulation in Sr2+ modified BaTiO3 capacitors	—	—	—
12	Revisiting eigen displacements of tetragonal BaTiO3: Combined first principle and experimental investigation	—	—	—
13	Non-Adiabatic Effect in Perovskites: Model and Ab Initio Hamiltonian for Spectral/Ferroelectric Properties	—	—	—
14	Ferroelectric phase transition in polymorphic Cd-doped barium calcium zirconate titanate (BCZT) ceramics	Amity University, Delhi Technological University, University of Delhi	India	—
15	High-pressure synthesis and crystal structure analysis of PbTeO 4, a UV transparent material	TU Wien, Universität Innsbruck	Austria	—
16	Construction of first-principles-based adiabatic and diabatic Hamiltonians for the TiO 6 8– unit	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
	of the BaTiO 3 crystal: photoemission spectra and ferroelectricity			
17	Large piezoelectric response in a family of metal-free perovskite ferroelectric compounds from first-principles calculations	—	—	—
18	Piezoelectricity and Thermophysical Properties of Ba0.90Ca0.10Ti0.96Zr0.04O3 Ceramics Modified with Amphoteric Nd3+ and Y3+ Dopants	Tokyo Institute of Technology, Xinyang Normal University, Yantai University	China, Japan	—
19	From S–O–S to B–O–S to B–O–B Bridges: Ba[B(S2O7)2]2 as a Model System for the Structural Diversity in Borosulfate Chemistry	—	—	—
20	Photoelasticity of crystals with the scheelite structure: quantum mechanical calculations	Częstochowa University of Technology, Lviv Polytechnic National University	Poland, Ukraine	—
21	First-principles study of lattice dynamics, structural phase transition, and thermodynamic properties of barium titanate	—	—	—
22	Theoretical and Experimental Study of (Ba,Sr)TiO3 Perovskite Solid Solutions and BaTiO3/SrTiO3 Heterostructures	—	—	—
23	Characterization of photoelastic materials by combined Mach-Zehnder and conoscopic interferometry: Application to tetragonal lithium tetraborate crystals	Częstochowa University of Technology, Lviv Polytechnic National University	Poland, Ukraine	—
24	High Dielectric Constants in BaTiO3 Due to Phonon Mode Softening Induced by Lattice Strains: First Principles Calculations	—	—	—
25	The first-principle study on certain structural, band-structural, elastic, optical and piezoelectric properties of the Ca, Zr and Ca/Zr-doped	—	—	—
26	Noninvasive Modulation of In-Plane Optical Anisotropy in ReSe2 via Etching-Induced Strain	—	—	—
27	Piezoelectric, elastic, Infrared and Raman behavior of ZnO wurtzite under pressure from periodic DFT calculations	Universidade Estadual Paulista, University of Turin	Brazil, Italy	—
28	Molybdenum disulfide monolayer electronic structure information as explored using density functional theory and quantum theory of atoms in molecules	The University of Texas Rio Grande Valley	United States	—
29	Silent Partners in the Mill: Unveiling the Role of Additives in Mechanochemical Synthesis	—	—	—
30	Structural and response properties of all BaTiO3 phases from density functional theory using the projector-augmented-wave methods	Universiti Sains Malaysia, University of Malaya	Malaysia	—

Showing the 30 most-cited of 46 independent citing papers.

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 2

Claim — Contribution 2

The researcher established a theoretical framework for inducing piezoelectricity in graphene via symmetry-breaking defects and extended this to heavy metal adsorption studies.

The researcher's contribution centers on modifying graphene's electronic and chemical properties through defect engineering. This line of work is anchored by a 2015 core paper that proposed inducing finite in-plane piezoelectricity in graphene using low concentrations of inversion symmetry-breaking defects. The titles indicate a focus on manipulating fundamental material symmetries to unlock new functional capabilities in carbon-based nanomaterials.

Originality in this work appears to lie in addressing the inherent limitations of pristine graphene, which lacks piezoelectric response due to its symmetric structure. By theoretically demonstrating how specific defects can break this symmetry, the researcher provided a novel pathway for functionalizing graphene. The subsequent 2020 follow-up papers suggest an expansion of this defect-engineering approach toward environmental applications, specifically investigating graphene and graphene oxide as adsorbents for cadmium and lead. This chronological progression implies a strategic broadening from fundamental electronic property modification to practical surface chemistry applications.

The significance of this research is evidenced by sustained academic interest. The core 2015 paper has accumulated 45 citations, while the 2020 follow-up studies have each garnered 80 citations, indicating growing relevance. Notably, 82.1% of the 340 classified citations for this scholar originate from independent researchers, suggesting that the community widely recognizes and builds upon these theoretical frameworks beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 33 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Inducing a finite in-plane piezoelectricity in graphene with low concentration of inversion symmetry-breaking defects

2015 · The Journal of Physical Chemistry C 119 (16), 8966-8973, 2015 · 45 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Spatial Anisotropy of Photoelasticity Determined by Path Difference in Ba3TaGa3Si2O14 Crystals	—	—	—
2	A review on the applications of graphene in mechanical transduction	—	—	—
3	Realization of Precise Human Gesture Recognition via a Self-Powered Flexible Sensor Based on Thermal Expansion-Treated and Potassium Ion-Modified VMT …	—	—	—
4	Piezotronics in two-dimensional materials	Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences	China	—
5	Piezocatalytic performances of conjugated microporous polymers with donor–acceptor structures for overall water splitting	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
6	Layer-dependent electromechanical response in twisted graphene moiré superlattices	National Institute for Materials Science	Japan	—
7	Piezoelectric Responses of Mechanically Exfoliated Two-Dimensional SnS2 Nanosheets	Deakin University, RMIT University	Australia	—
8	Peculiar piezoelectricity of atomically thin planar structures	RMIT University, Shanghai University	Australia, China	—
9	Interlayer Slip Engineering Induces Unexpected Out-Of-Plane Piezoelectricity in Group-VA Nanosheets	—	—	—
10	Enhancing vertical piezoelectricity in Al-doped β-Ga2O3 bilayer: a first-principles study	—	—	—
11	Enhanced piezoelectric effect at the edges of stepped molybdenum disulfide nanosheets	Brookhaven National Laboratory	United States	—
12	Switchable polarization in an unzipped graphene oxide monolayer	—	—	—
13	Electron scattering by Friedel oscillations in carbon nanotubes	—	—	—
14	The fundamental noise in monolayer graphene	—	—	—
15	Effect of the charge-carrier–phonon interaction on the fundamental voltage noise	Lomonosov Moscow State University	Russia	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

FOLLOW-UP WORK

Graphene and graphene oxide as adsorbents for cadmium and lead heavy metals: A theoretical investigation

2020 · 80 citations (GS)

Field-normalised: 62 Semantic Scholar citations place it in the top 10% of Chemistry papers from 2020 indexed by Semantic Scholar, by citation count.

No independent citing papers resolved for this paper in the current crawl.

FOLLOW-UP WORK

Graphene and graphene oxide as adsorbents for cadmium and lead heavy metals: A theoretical investigation

2020 · Applied Surface Science 507, 145038, 2020 · 80 citations (GS)

Field-normalised: 62 Semantic Scholar citations place it in the top 10% of Chemistry papers from 2020 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Insights into energy and environmental sustainability through photoactive graphene-based advanced materials: perspectives and promises	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
2	Synthetic routes of the reduced graphene oxide	University of Tsukuba	Japan	—
3	Lithium storage mechanisms and electrochemical behavior of a molybdenum disulfide nanoparticle anode	Argonne National Laboratory, Shanghai Advanced Research Institute Chinese Academy of Sciences	China, United States	—
4	C3B2 Quantum Dot: A Potential Candidate for Heavy Metal Ion Detection and Removal in Wastewater Treatment	—	—	—
5	Cadmium removal from water using conventional and emerging adsorbents: Current status, challenges, and future perspectives	Imam Mohammad Ibn Saud Islamic University, King Faisal University, Northern Border University	Pakistan, Saudi Arabia	—
6	Understanding of light absorption properties of the N-doped graphene oxide quantum dot with TD-DFT	University of South Dakota	United States	—
7	A Review on Graphene-based adsorbents for the remediation of toxic heavy metals from aqueous sources	—	—	Background
8	Preparation of polyethylenimine and carboxymethyl cellulose co-modified magnetic bentonite for enhanced adsorption of Pb (II) and Cd (II) based on the concept of …	University of Peshawar	Pakistan	**Influential**
9	Recycling of graphene oxide nanocollector used in ion flotation for reusing in the wastewater treatment	Amirkabir University of Technology	Iran	—
10	Potential molecular and graphene oxide chelators to dissolve amyloid-β plaques in Alzheimer's disease: A density functional theory study	—	—	—
11	An environmentally friendly and simple method for producing multi-layer exfoliated graphene in mass production from pencil graphite and its utilization for removing …	—	—	Background
12	Detection of cyanogen (NCCN) on Ga-, In-, and Tl-doped aluminium nitride (AlN) nanotube: insights from quantum chemical calculations	—	—	—
13	First–Principle Investigation of Functionalized Graphene Oxides as Advanced Adsorbents for Hazardous Gases: Insights Into H2S, NO2, and SO2 Capture	—	—	—
14	Separation of CH4, H2S, N2 and CO2 gases using four types of nanoporous graphene cluster model: a quantum chemical investigation	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
15	Physical, Mechanical and Electrical Properties of Chitosan/Graphene Oxide Composite Films for Copper Ions (Cu2+) Detection	—	—	—
16	Study on adsorption behavior of liquid metal atom (Pb/Bi) on defect Fe (111) surface: Mao et al.	—	—	—
17	Carbonaceous Nanomaterials for Environmental Remediation	National Central University	Taiwan	—
18	Cd-substitution effect on photoexcitation properties of ZnO nanodots surrounded by carbon moiety	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 3

Claim — Contribution 3

The researcher established foundational insights into spin and electronic properties of strongly correlated sesquioxides, subsequently extending this framework to demonstrate extraordinary piezoelectric effects in reduced-dimensionality rare earth monochalcogenides.

The researcher's contribution centers on a seminal 2018 study investigating spin localization, magnetic ordering, and electronic properties in strongly correlated sesquioxides. This core work serves as the foundation for a broader research line that explores the physical properties of rare earth-based materials under varying dimensional constraints.

This line of work appears to address the challenge of understanding complex magnetic and electronic behaviors in correlated systems. By progressing from bulk sesquioxides to two-dimensional rare earth monochalcogenides, the researcher's subsequent 2023 publications suggest an original approach to inducing extraordinary piezoelectric effects through the reduction of system dimensionality, thereby linking fundamental magnetic properties with functional electromechanical responses.

The significance of this research is evidenced by the substantial uptake of the core paper, which has accumulated 53 citations. Furthermore, analysis of the researcher's broader citation record indicates that 82.1% of citations originate from independent researchers, suggesting that this body of work has achieved wide recognition and influence beyond the researcher's immediate institutional circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 23

CORE PAPER

Spin localization, magnetic ordering, and electronic properties of strongly correlated sesquioxides (Ln=La, Ce, Pr, Nd)

2018 · Physical Review B 97 (24), 245118, 2018 · 53 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Surface-driven electron localization and defect heterogeneity in ceria	London South Bank University, ShanghaiTech University, STFC Daresbury Laboratory	China, Japan, U.K	—

No.	Citing paper	Citing institution(s)	Country	S2
2	Toward a Consistent Prediction of Defect Chemistry in CeO2	University College London	U.K	—
3	Orbital-overlap-driven hybridization in 3d-transition metal perovskite oxides LaMO3 (M = Ti-Ni) and La2CuO4	University of Vienna	Austria	—
4	Vibrational frequencies of cerium-oxide-bound CO: A challenge for conventional DFT methods	—	—	—
5	Electron-phonon mediated superconductivity in nickel oxides	Université Paris-Saclay	France	—
6	Investigations of pressurized Lu–N–H materials by using the hybrid functional	Chinese Academy of Sciences, TU Wien	Austria, China	—
7	BSSE-corrected consistent Gaussian basis sets of triple-zeta valence quality of the lanthanides La-Lu for solid-state calculations	—	—	—
8	Development and application of a ReaxFF reactive force field for cerium oxide/water interfaces	—	—	—
9	Ab Initio Approach to the Temperature-Dependent Coupled Substitution of Rare Earth Elements (REE) into Fluorapatite using Halide (F, Cl), Monazite, Bastnäsite …	University of Michigan	United States	—
10	Tellurium Doping and the Structural, Electronic, and Optical Properties of NaYS2(1−x)Te2x Alloys	—	—	—
11	The Raman spectrum of florencite-(REE) [REEAl3(PO4)2(OH)6]: An integrated experimental and computational approach	—	—	—
12	Hybrid density functional theoretical study of NASICON-type Na x Ti 2 (PO 4) 3 (x= 1–4)	—	—	—
13	Origin of the abnormal reduction of the dielectric response for ReCOB crystals and its mechanism: theoretical and experimental exploration	—	—	—
14	Separation of quadrupolar and paramagnetic shift interactions with TOP-STMAS/MQMAS in solid-state lighting phosphors	—	—	—
15	Combining semilocal exchange with dynamical mean-field theory: Electronic structure and optical response of rare-earth sesquioxides	École Polytechnique	France	—
16	The magnetic properties of pressurized CsV 3 Sb 5 calculated by using a hybrid functional	Chinese Academy of Sciences, TU Wien	Austria, China	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

FOLLOW-UP WORK

Extraordinary piezoelectric effect induced in two-dimensional rare earth monochalcogenides via reducing system dimensionality

2023 · 10 citations (GS)

No independent citing papers resolved for this paper in the current crawl.

FOLLOW-UP WORK

Extraordinary piezoelectric effect induced in two-dimensional rare earth monochalcogenides via reducing system dimensionality

2023 · Journal of Materiomics 9 (1), 72-81, 2023 · 10 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Piezoelectricity and Thermophysical Properties of Ba0.90Ca0.10Ti0.96Zr0.04O3 Ceramics Modified with Amphoteric Nd3+ and Y3+ Dopants	Tokyo Institute of Technology, Xinyang Normal University, Yantai University	China, Japan	—
2	Enhancing vertical piezoelectricity in Al-doped β-Ga2O3 bilayer: a first-principles study	—	—	—
3	Recent Development in Emerging 2D Rare Earth Materials: Compositions, Syntheses, and Applications	—	—	—
4	Large negative magnetoresistance in antiferromagnetic	Massachusetts Institute of Technology, National Institute for Materials Science, University of Arkansas	Japan, United States	—
5	Intriguing two-dimensional beo-based tribo-piezoelectric nanogenerator	—	—	—
6	Giant piezoelectricity and ferroelectricity in two-dimensional ThOTe monolayers	University of Jinan	People's Republic of China	—
7	Determination of the flexoelectric coefficient in nematic liquid crystals by using fully leaky optical guided mode	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
University of Turin	Italy	THE 401–500 · QS 408	16
University of Stuttgart	Germany	SCImago #1513 · THE 251–300 · QS =310	13
Universidade Estadual Paulista	Brazil	THE 601–800	11
Università di Torino	Italy	—	6
University of California, Santa Barbara	United States	SCImago #584 · THE 72 · QS 179	5
Chinese Academy of Sciences	China	SCImago #2	5
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	3
Universität Innsbruck	Austria	SCImago #1771 · QS =350	3
The University of New South Wales	Australia	SCImago #107 · QS 20	3

Institution	Country	World ranking	Citing papers
TU Wien	Austria	SCImago #1661 · THE 301–350 · QS =197	3
University College London	United Kingdom	SCImago #30	3
The University of Texas Rio Grande Valley	United States	SCImago #5451 · THE 1501+	3
University of New South Wales	Australia	SCImago #107 · QS 20	3
Southwest Jiaotong University	China	SCImago #509 · THE 801–1000	3
Oak Ridge National Laboratory	United States	SCImago #915	3

Geographic distribution of citing authors

Country	Citing papers
United States	30
Italy	20
Germany	17
China	17
Brazil	14
Japan	9
Australia	8
India	7
United Kingdom	7
Austria	7
Russia	5
Saudi Arabia	5

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).

- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Piezoelectricity of SrTiO: An ab initio description	118	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Inducing a finite in-plane piezoelectricity in graphene with low concentration of inversion symmetry-breaking defects	33	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Spin localization, magnetic ordering, and electronic properties of strongly correlated sesquioxides (Ln=La, Ce, Pr, Nd)	23	8 CFR 204.5(h)(3)(v) — Criterion 5