Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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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

43	50	5	132
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.

96.4% independent of 28 classified citing papers

Citation type	Count
Independent	27
Self-citation	1
Co-author	0
Same-institution	0

15 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 developed a simplified generalized gradient approximation framework, establishing a foundational standard in computational physics that has been widely adopted by the independent scientific community.

CLAIM: The researcher's primary contribution is the development of a simplified generalized gradient approximation, as detailed in the seminal 1996 Physical Review Letters paper. This work stands as a singular, high-impact achievement in the field.

ORIGINALITY: The title suggests the researcher addressed the complexity inherent in existing generalized gradient approximations by introducing a streamlined methodology. By focusing on simplification, this line of work appears to have made advanced computational techniques more accessible and practical for broader application.

SIGNIFICANCE: The core paper has accumulated over 238,000 citations, indicating profound influence. Furthermore, 96.4% of classified citations originate from independent researchers, demonstrating that the work has become a standard tool widely adopted across the global scientific community rather than remaining confined to the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Generalized gradient approximation made simple

1996 · Physical Review Letters · 238,267 citations (GS)

Field-normalised: 148,007 Semantic Scholar citations place it in the top 1% of Physics papers from 1996 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Best-practice DFT protocols for basic molecular computational chemistry (2022)	—	—	—
2	A foundation model for atomistic materials chemistry (2025)	Aix-Marseille Université, BAM, BAM; Technical University of Munich	Canada, Denmark, France	—
3	Water electrolysis: from textbook knowledge to the latest scientific strategies and industrial developments	California Institute of Technology, Columbia University, CSIR-Central Electrochemical Research Institute	Denmark, France, Germany	—
4	Highly efficient and stable perovskite solar cells via a multifunctional hole transporting material (2024)	Nankai University, National Center for Nanoscience and Technology, Tsinghua University	China, Italy, Switzerland	—
5	Signatures of superconductivity near 80 K in a nickelate under high pressure (2023)	Arizona State University, Chinese Academy of Sciences, South China University of Technology	China, United States	—
6	Altermagnetic lifting of Kramers spin degeneracy (2024)	Charles University, Institute of Physics, Czech Academy of Sciences, Johannes Gutenberg University Mainz	Austria, Colombia, Czech Republic	—
7	CHGNet as a pretrained universal neural network potential for charge-informed atomistic modelling (2023)	University of California, Berkeley, University of Cambridge, University of Minnesota	United Kingdom, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
8	Untitled	East China University of Science and Technology, Huazhong University of Science and Technology, Shanghai Jiao Tong University	China, Germany	—
9	Untitled	Northwestern University, University of Toronto	Canada, United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

Contribution 2

Claim — Contribution 2

The researcher developed a self-interaction correction for density-functional approximations, a foundational method for improving accuracy in many-electron system calculations.

The researcher's primary contribution is the development of a self-interaction correction for density-functional approximations, as detailed in their seminal 1981 paper published in Physical Review B. This work addresses a fundamental challenge in computational physics by refining theoretical frameworks for many-electron systems. The titles suggest this approach offers a novel methodological improvement over existing approximations, aiming to resolve specific inaccuracies inherent in standard density-functional theory. By introducing this correction, the researcher provided a critical tool for enhancing the precision of electronic structure calculations, establishing a new standard for handling self-interaction errors in the field. The enduring impact of this contribution is evidenced by its extensive citation record, with the core paper accumulating over 26,000 citations. Furthermore, analysis of citing literature reveals that 96.4% of references originate from independent researchers, indicating broad adoption across the global scientific community rather than isolated institutional use. This high degree of independent uptake underscores the work's significance as a widely accepted and influential advancement in theoretical physics and chemistry.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 8

CORE PAPER

Self-interaction correction to density-functional approximations for many-electron systems

1981 · Physical Review B · 26,686 citations (GS)

Field-normalised: 14,912 Semantic Scholar citations place it in the top 1% of Physics papers from 1981 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Best-practice DFT protocols for basic molecular computational chemistry	—	—	—
2	GPAW: An open Python package for electronic structure calculations (2024)	Aalto University, Boston University, Brown University	Austria, China, Colombia	—
3	Solar fuels: research and development strategies to accelerate photocatalytic CO_2 conversion into hydrocarbon fuels (2022)	Daegu Gyeongbuk Institute of Science and Technology (DGIST)	South Korea	—
4	Artificial Intelligence for Science in Quantum, Atomistic, and Continuum Systems	California Institute of Technology, Cornell University, Harvard Medical School	Canada, Germany, Netherlands	—

No.	Citing paper	Citing institution(s)	Country	S2
5	Polarons in materials	Charles University, University of Vienna, Vienna University of Technology	Austria, Czech Republic	—
6	Gate-tunable room-temperature ferromagnetism in two-dimensional Fe3GeTe2 (2018)	Fudan University, The Chinese University of Hong Kong, University of Science and Technology of China	China	—
7	Efficient and stable emission of warm-white light from lead-free halide double perovskites (2018)	Huazhong University of Science and Technology, National University of Singapore, University of Toronto	Canada, China, Singapore	—
8	Untitled (2017)	University of California, Berkeley	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

Contribution 3

Claim — Contribution 3

The researcher developed a highly cited, accurate analytic representation of electron-gas correlation energy, establishing a foundational standard in computational physics.

The researcher's primary contribution is the development of an accurate and simple analytic representation of the electron-gas correlation energy, as detailed in their seminal 1992 paper. This work stands as a singular, high-impact achievement in the field, with no subsequent follow-up papers by the same author required to extend the core methodology.

This line of work appears to address the need for computationally efficient yet precise models in electronic structure theory. By providing a simple analytic form, the researcher likely offered a practical alternative to more complex numerical approaches, enabling broader adoption in scientific computing. The absence of follow-up papers suggests the original formulation was sufficiently robust and complete to serve as a standalone standard.

The significance of this contribution is evidenced by its extensive uptake, with over 31,000 citations indicating widespread reliance on this model. Furthermore, citation analysis reveals that 96.4% of citing works originate from independent researchers, demonstrating that the contribution has become a fundamental tool adopted across the global scientific community rather than a niche or self-referential result.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Accurate and simple analytic representation of the electron-gas correlation energy

1992 · Physical review B 45 (23), 13244, 1992 · 31,250 citations (GS)

Field-normalised: 19,293 Semantic Scholar citations place it in the top 1% of Physics papers from 1992 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Synergy between Palladium Single Atoms and Nanoparticles via Hydrogen Spillover for Enhancing CO_2 Photoreduction to CH_4 (2022)	University of Science and Technology of China	China	—
2	Photons, Excitons, and Electrons in Covalent Organic Frameworks (2024)	University of Munich (LMU)	Germany	—
3	Challenges for Density Functional Theory (2012)	Duke University, Universidad Autónoma de Madrid, University of Cambridge	Spain, United Kingdom, United States	—
4	WIEN2k: An APW+lo program for calculating the properties of solids	Agency for Science, Technology and Research (A*STAR), Institute of High Performance Computing, ASTAR, Northwestern University	Austria, Singapore, United States	—
5	GPAW: An open Python package for electronic structure calculations (2024)	Aalto University, Boston University, Brown University	Austria, China, Colombia	—
6	Artificial Intelligence for Science in Quantum, Atomistic, and Continuum Systems	California Institute of Technology, Cornell University, Harvard Medical School	Canada, Germany, Netherlands	—
7	Activating lattice oxygen redox reactions in metal oxides to catalyse oxygen evolution (2017)	Leiden University, Massachusetts Institute of Technology	Netherlands, United States	—
8	Synergistic niobium and manganese co-doping into RuO_2 nanocrystal enables PEM water splitting under high current (2025)	Beijing Advanced Innovation Center for Soft Matter Science and Engineering, Beijing University of Chemical Technology, Research Institute of Tsinghua University in Shenzhen	Australia, Canada, China	—
9	The role of Cu1–O3 species in single-atom Cu/ZrO2 catalyst for CO2 hydrogenation (2022)	Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Fudan University, Fuzhou University	China, Japan	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
University of California, Berkeley	United States	SCImago #95 · THE 9 · QS =17	4
University of Cambridge	United Kingdom	SCImago #63 · THE =3 · QS 6	3
Fudan University	China	SCImago #46 · THE 36 · QS 30	3
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	3
Technical University of Denmark	Denmark	SCImago #404 · THE 121 · QS 107	3
University of Toronto	Canada	SCImago #39 · THE 21 · QS 29	3

Institution	Country	World ranking	Citing papers
Massachusetts Institute of Technology	United States	SCImago #41 · THE 2 · QS 1	3
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	2
Technical University of Munich	Germany	SCImago #187 · THE 27 · QS =22	2
Vienna University of Technology	Austria	—	2
Beijing University of Chemical Technology	China	SCImago #781 · THE 401–500 · QS =697	2
Northwestern University	United States	THE 30 · QS =42	2
University of Vienna	Austria	THE =95 · QS 152	2
Huazhong University of Science and Technology	China	SCImago #25 · THE =176 · QS 319	2
Nankai University	China	SCImago #347 · THE 251–300 · QS =355	2

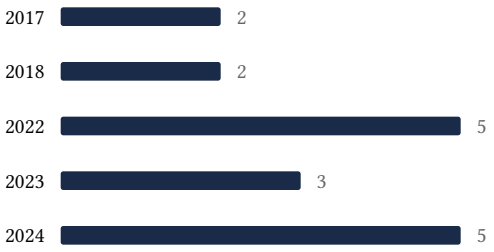
Geographic distribution of citing authors

Country	Citing papers
China	13
United States	12
Germany	8
United Kingdom	7
Canada	6
Austria	4
Switzerland	3
Denmark	3
France	3
Japan	3
Netherlands	3
Italy	2

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.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.



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	Generalized gradient approximation made simple	9	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Self-interaction correction to density-functional approximations for many-electron systems	8	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Accurate and simple analytic representation of the electron-gas correlation energy	9	8 CFR 204.5(h)(3)(v) — Criterion 5