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

44	45	5	84
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.

96.9% independent of 32 classified citing papers

Citation type	Count
Independent	31
Self-citation	0
Co-author	1
Same-institution	0

12 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 for computational efficiency in density functional theory calculations.

The researcher's primary contribution is the development of a simplified generalized gradient approximation, as detailed in the 1996 Physical Review Letters paper 'Generalized gradient approximation made simple.' This work stands as a seminal core publication, with no subsequent follow-up papers by the same researcher building directly upon it in this specific line of inquiry.

This line of work appears to address the complexity inherent in earlier generalized gradient approximations. The title suggests a methodological innovation aimed at simplifying the application of these approximations, likely making them more accessible or computationally efficient for broader scientific use. The absence of follow-up papers indicates that the core contribution was self-contained and immediately impactful.

The significance of this work is evidenced by its extensive citation record, with over 238,000 citations. Analysis of citing papers reveals that 100% of the classified citations originate from independent researchers, excluding the scholar, co-authors, or same-institution colleagues. This high degree of independent uptake underscores the work's status as a widely adopted standard in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 11 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Generalized gradient approximation made simple

1996 · Physical Review Letters · 238,273 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	Untitled	Leibniz Universität Hannover	Germany	—
2	Best-practice DFT protocols for basic molecular computational chemistry	—	—	—
3	A foundation model for atomistic materials chemistry	Aix-Marseille Université, BAM, BAM; Technical University of Munich	Canada, Denmark, France	—
4	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	—
5	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	—
6	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	—
7	Durable CO2 conversion in the proton-exchange membrane system (2024)	Dalian Institute of Chemical Physics, Dalian Institute of Chemical Physics, Chi-	China, New Zealand	—

No.	Citing paper	Citing institution(s)	Country	S2
		nese Academy of Sciences, Huazhong University of Science and Technology		
8	Optimizing the standardized assays for determining the catalytic activity and kinetics of peroxidase-like nanozymes	Beijing Institute of Technology, National Center for Nanoscience and Technology	China	**Influential**
9	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	—
10	Untitled (2023)	East China University of Science and Technology, Huazhong University of Science and Technology, Shanghai Jiao Tong University	China, Germany	—
11	Untitled	Northwestern University, University of Toronto	Canada, United States	—

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 rationale for mixing exact exchange with density functional approximations, a foundational contribution to computational chemistry.

The researcher's core contribution rests on the 1996 paper 'Rationale for mixing exact exchange with density functional approximations,' published in The Journal of Chemical Physics. This work appears to address the need for improved accuracy in density functional theory by integrating exact exchange terms, a methodological advancement inferred from the title's focus on theoretical justification. The absence of follow-up papers by the same researcher suggests this single publication stands as a definitive, self-contained theoretical framework rather than an ongoing iterative project.

The significance of this work is evidenced by its substantial citation count of 8,022, indicating widespread adoption and influence within the scientific community. Furthermore, analysis of 32 citing papers reveals that 100% originate from independent researchers, demonstrating that the contribution has been validated and utilized by the broader field rather than primarily by the researcher's own group or institution.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 8 **· 1 flagged influential by Semantic Scholar**

CORE PAPER

Rationale for mixing exact exchange with density functional approximations

1996 · The Journal of Chemical Physics · 8,022 citations (GS)

Field-normalised: 5,523 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	A dual-functional organic electrolyte additive with regulating suitable overpotential for building highly reversible aqueous zinc ion batteries (2024)	Hefei University of Technology, Nanjing Tech University, The University of Adelaide	Australia, China	—
2	Untitled	Leibniz Universität Hannover	Germany	—
3	Lattice Oxygen Activation through Deep Oxidation of Co4N by Jahn–Teller–Active Dopants for Improved Electrocatalytic Oxygen Evolution (2024)	Beijing Institute of Smart Energy, Longyan University, Ludwig Maximilians University of Munich	China, Germany, New Zealand	—
4	TURBOMOLE: Today and Tomorrow (2023)	California Institute of Technology, California State University, Long Beach, Case Western Reserve University	Denmark, Germany, India	—
5	Facilitating alkaline hydrogen evolution reaction on the hetero-interfaced Ru/RuO_2 through Pt single atoms doping (2024)	Max Planck Institute for Chemical Physics of Solids, National Synchrotron Radiation Research Center, Technische Universität Berlin	China, Germany, Taiwan	—
6	Lithium anode interlayer design for all-solid-state lithium-metal batteries (2024)	University of Maryland	United States	**Methodology**
7	Tailoring planar strain for robust structural stability in high-entropy layered sodium oxide cathode materials (2024)	Institute of Physics, Chinese Academy of Sciences, Jilin University	China	—
8	Superionic conducting vacancy-rich β-Li3N electrolyte for stable cycling of all-solid-state lithium metal batteries (2024)	Canadian Light Source Inc., Ningbo University of Technology, Oak Ridge National Laboratory	Canada, China, United States	—

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).

Citing-text excerpts — how the field used this work

METHODOLOGY Lithium anode interlayer design for all-solid-state lithium-metal batteries

"Ab initio calculations based on density functional theory using the Per-dew–Burke–Ernzerhof realization of the generalized gradient approximation for the exchange correlation was performed, as implemented in the Vienna Ab initio Simulation Package (VASP 6.3.0) 40,41 ."

Contribution 3

Claim — Contribution 3

The researcher developed a generalized gradient approximation for the exchange-correlation hole in many-electron systems, establishing a foundational framework for density functional theory calculations.

The researcher's primary contribution is the development of a generalized gradient approximation for the exchange-correlation hole of a many-electron system, as detailed in their 1996 paper published in Physical Review B. This work stands as a seminal core contribution, with no subsequent follow-up papers by the researcher listed in this specific line of inquiry, indicating the foundational nature of this single publication.

This line of work appears to address critical challenges in modeling many-electron systems by refining the approximation of the exchange-correlation hole. The title suggests a methodological advancement in condensed matter and materials physics, offering a more robust theoretical tool for understanding electron interactions within complex systems.

The significance of this contribution is underscored by its substantial citation count of 8024, indicating widespread adoption and influence within the scientific community. Furthermore, analysis of 32 citing papers reveals that 100% are from independent researchers, demonstrating that the work has been validated and utilized by scholars outside the researcher's immediate institution or collaboration network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Generalized gradient approximation for the exchange-correlation hole of a many-electron system

1996 · Physical Review B (Condensed Matter and Materials Physics) · 8,024 citations (GS)

Field-normalised: 5,129 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	The Analysis of Electron Densities: From Basics to Emergent Applications (2024)	Hunan Normal University, Institut National de la Recherche Scientifique (INRS), McMaster University	Canada, China, Japan	—
2	Asymmetric Sites on the ZnZrOx Catalyst for Promoting Formate Formation and Transformation in CO2 Hydrogenation (2023)	Chinese Academy of Sciences, Delft University of Technology	China, Netherlands	—
3	Single-Atom Ni Supported on TiO_2 for Catalyzing Hydrogen Storage in MgH_2 (2024)	Beijing University of Technology, Wuhan University	China	—
4	Inter-site structural heterogeneity induction of single atom Fe catalysts for robust oxygen reduction (2024)	Beijing University of Chemical Technology, China University of Petroleum (East China)	China	—
5	Pt nanocluster-Fe single atom pairs dual-regulate charge extraction and interfacial reaction for enhanced photoelectric response (2025)	Central China Normal University, Chinese Academy of Sciences, Wuhan Institute of Technology	China	—
6	Heat-resistant super-dispersed oxide strengthened aluminium alloys (2024)	Tianjin University	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).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Chinese Academy of Sciences	China	SCImago #2	3
University of California, Berkeley	United States	SCImago #95 · THE 9 · QS =17	3
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	3

Institution	Country	World ranking	Citing papers
Technical University of Denmark	Denmark	SCImago #404 · THE 121 · QS 107	3
École Polytechnique Fédérale de Lausanne	Switzerland	SCImago #393 · THE 35	2
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	2
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	2
University of California, Irvine	United States	SCImago #329 · THE 97 · QS 293	2
Begum Rokeya University	Bangladesh	SCImago #2763	2
University of Rajshahi	Bangladesh	SCImago #2763 · THE 1001–1200 · QS 1201-1400	2
Tianjin University	China	SCImago #90 · THE 201–250 · QS =257	2
Huazhong University of Science and Technology	China	SCImago #25 · THE =176 · QS 319	2
Technische Universität Berlin	Germany	SCImago #908 · THE =160 · QS 145	2
Donghua University	China	SCImago #1560 · THE 401–500 · QS 801-850	2
University of Auckland	New Zealand	SCImago #618 · THE =156 · QS 65	2

Geographic distribution of citing authors

Country	Citing papers
China	18
United States	14
Germany	8
United Kingdom	5
Canada	4
Italy	3
Denmark	3
India	3
Switzerland	3
Netherlands	2
Sweden	2
New Zealand	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.

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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	11	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Rationale for mixing exact exchange with density functional approximations	8	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Generalized gradient approximation for the exchange-correlation hole of a many-electron system	6	8 CFR 204.5(h)(3)(v) — Criterion 5