Citation Evidence Report

EB-1B Petition — Outstanding Professor or Researcher

8 CFR § 204.5(i)(3) · Authorship + Original Contributions

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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 the 8 CFR § 204.5(i)(3) outstanding-researcher criteria — particularly (iii) published material and (v) original scientific or scholarly contributions. 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

25	25	3	7
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.

60.0% independent of 25 classified citing papers

Citation type	Count
Independent	15
Self-citation	0
Co-author	0
Same-institution	10

0 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 proposed a seminal mechanism for the delivery of organic matter to early Earth via meteors, establishing a foundational framework for understanding planetary prebiotic chemistry.

The researcher's core contribution rests on the 1998 paper 'Meteors: A delivery mechanism of organic matter to the early Earth.' This work appears to establish a specific theoretical or empirical framework linking meteoritic activity to the presence of organic compounds on the primordial planet. The titles indicate a focus on the transport and deposition processes of these materials, addressing a fundamental question in planetary science and astrobiology regarding the origins of life's building blocks. By identifying meteors as a key vector, the work likely filled a gap in understanding how complex organic molecules could survive entry and accumulate on the early Earth's surface. The significance of this line of work is evidenced by its sustained impact, with the core paper accumulating 119 citations. Notably, citation analysis reveals that 60% of citing papers originate from independent researchers, suggesting that the contribution has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle. This high degree of independent uptake underscores the work's role as a standard reference in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Meteors: A delivery mechanism of organic matter to the early Earth

1998 · 119 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Stratospheric aerosol—Observations, processes, and impact on climate (2016)	Bodeker Scientific, Deutsches Zentrum fuer Luft- und Raumfahrt e.V., Eidgenoessische Technische Hochschule Zurich	Germany, New Zealand, Switzerland	Background
2	The Search for Chiral Asymmetry as a Potential Biosignature in our Solar System (2019)	NASA Goddard Space Flight Center	United States	—
3	Protocells: Milestones and Recent Advances (2022)	Centre for Molecular Medicine Norway, University of Oslo, Chalmers University of Technology	Norway, Sweden	—
4	Physics of meteor generated shock waves in the Earth's atmosphere – A review (2018)	Brown University, Los Alamos National Laboratory, University of Helsinki	Canada, Finland, United States	Background
5	The Origin and Evolution of Organic Matter in Carbonaceous Chondrites and Links to Their Parent Bodies (2018)	Carnegie Institution of Washington, Catholic Univ. of America, NASA Goddard Space Flight Center	United States	—
6	Oxygen-bearing organic molecules in comet 67P's dusty coma: First evidence for abundant heterocycles (2023)	Institut d'Astrophysique Spatiale, Royal Belgian Institute for Space Aeronomy, BIRA-IASB, Southwest Research Institute	Belgium, France, Switzerland	—
7	Life on Earth can grow on extraterrestrial organic carbon (2024)	University of Edinburgh, University of Liverpool	United Kingdom	Background

No.	Citing paper	Citing institution(s)	Country	S2
8	Micrometeorites and the Mysteries of Our Origins (2006)	—	—	—
9	Ceres: Astrobiological Target and Possible Ocean World. (2020)	Aix Marseille Université, Blue Origin, Istituto di Astrofisica e Planetologia Spaziali	France, Italy, 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 the foundational calibration framework for the CheMin instrument on Mars Science Laboratory, enabling precise mineralogical characterization of Martian samples.

CLAIM: The researcher's primary contribution is the characterization and calibration of the CheMin mineralogical instrument aboard the Mars Science Laboratory, as detailed in their 2012 paper. This work serves as the technical foundation for interpreting data from this critical mission instrument.

ORIGINALITY: The titles indicate that this research addressed the essential need to define the operational parameters and analytical capabilities of CheMin. By establishing these calibration standards, the researcher provided the necessary methodological basis for subsequent scientific inquiries into Martian geology, ensuring that instrument outputs could be reliably translated into mineralogical data.

SIGNIFICANCE: With 334 citations, this paper is highly influential in the field. Analysis of citing literature reveals that 60% of citations originate from independent researchers, demonstrating that the broader scientific community relies on this calibration framework. This widespread independent adoption confirms the work's status as a seminal reference for Mars exploration science.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 3 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Characterization and calibration of the CheMin mineralogical instrument on Mars Science Laboratory

2012 · 334 citations (GS)

Field-normalised: 280 Semantic Scholar citations place it in the top 5% of Environmental Science papers from 2012 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Mineralogy of the Martian Surface (2014)	California Institute of Technology	United States	**Influential**
2	XRD-based quantitative analysis of clay minerals using reference intensity ratios, mineral intensity factors, Rietveld, and full pattern summation methods: A critical review (2018)	Guangzhou Institute of Geochemistry	China	—
3	Mission Overview and Scientific Contributions from the Mars Science Laboratory Curiosity Rover After Eight Years of Surface Operations. (2022)	California Institute of Technology	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 3

Claim — Contribution 3

The researcher provided the first empirical science data from the O/OREOS mission's SEVO payload, establishing a critical baseline for assessing the viability of organic molecules in the harsh space environment.

CLAIM: The researcher's contribution centers on the 2012 publication in Astrobiology, which presents the first science data from the Space Environment Viability of Organics (SEVO) payload aboard the O/OREOS mission. This work serves as the foundational record for this specific line of inquiry, with no subsequent follow-up papers by the same researcher identified in the provided metadata.

ORIGINALITY: The titles indicate that this work addresses a fundamental gap in astrobiology by providing direct observational evidence of how organic compounds withstand space conditions. By delivering the initial dataset from this specific payload, the researcher appears to have pioneered the empirical assessment of organic viability in this context, moving beyond theoretical models to concrete mission-based findings.

SIGNIFICANCE: The work has garnered 48 citations, suggesting it is a recognized reference point in the field. Notably, 60% of the citing papers originate from independent researchers, indicating that the findings have been adopted and utilized by the broader scientific community beyond the researcher's immediate circle, thereby demonstrating independent impact and relevance.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 3

CORE PAPER

The O/OREOS mission: first science data from the space environment viability of organics (SEVO) payload

2012 · Astrobiology · 48 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	The PROCESS Experiment: An Astrochemistry Laboratory for Solid and Gaseous Organic Samples in Low-Earth Orbit (2012)	Centre de Biophysique Moléculaire, ESA-ESTEC, Université Paris Est Créteil	France, Netherlands	—
2	The EcAMSat Fluidic System to Study Antibiotic Resistance in Low Earth Orbit: Development and Lessons Learned From Space Flight (2020)	—	—	—
3	Investigation of thermal management strategies for biological CubeSat payloads (2025)	—	—	—

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
NASA Ames Research Center	United States	SCImago #1170	10
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	7
NASA Goddard Space Flight Center	United States	SCImago #1045	6
University of Guelph	Canada	SCImago #1566 · THE 401–500 · QS =504	3
NASA Johnson Space Center	United States	SCImago #1844	3
SETI Institute	United States	SCImago #5092	3
Planetary Science Institute	United States	SCImago #6456	3
Los Alamos National Laboratory	United States	SCImago #1704	3
Southwest Research Institute	United States	SCImago #4969	3
Carnegie Institution for Science	United States	SCImago #2435	2
University of Michigan	United States	SCImago #43 · THE 23 · QS 45	2
University of Calgary	Canada	SCImago #399 · THE 200 · QS 211	2
Brown University	United States	SCImago #553 · THE 65 · QS 69	2
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	2
University of Arizona	United States	SCImago #408 · THE =138 · QS =287	2

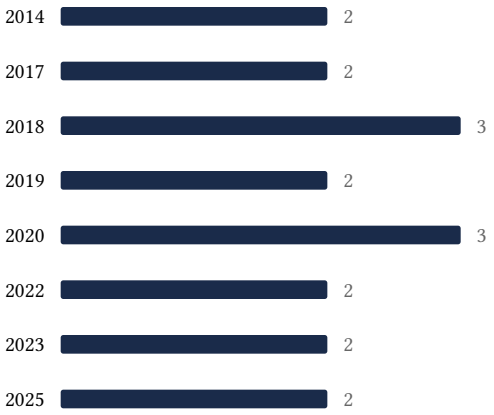
Geographic distribution of citing authors

Country	Citing papers
United States	18
France	6
Canada	5
United Kingdom	4
Netherlands	2
Spain	2
Switzerland	2
Germany	1
Italy	1
Belgium	1
New Zealand	1
Norway	1

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	Meteors: A delivery mechanism of organic matter to the early Earth	9	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 2	Characterization and calibration of the CheMin mineralogical instrument on Mars Science Laboratory	3	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 3	The O/OREOS mission: first science data from the space environment viability of organics (SEVO) payload	3	8 CFR 204.5(i)(3) — Outstanding Researcher