Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

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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 Prong 2 of Matter of Dhanasar (the petitioner is well positioned to advance the proposed endeavor) — the prong where past citation evidence is most probative. 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

42	42	5	58
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.

81.0% independent of 42 classified citing papers

Citation type	Count
Independent	34
Self-citation	0
Co-author	8
Same-institution	0

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 developed a crossover approach to global critical phenomena in fluids, establishing a theoretical framework later applied to the thermodynamics of supercooled water.

The researcher's core contribution rests on the 1992 paper 'Crossover approach to global critical phenomena in fluids,' published in Physica A. This work appears to have established a foundational method for analyzing critical behavior in fluid systems, serving as the basis for subsequent research by the same scholar.

This line of work addresses the complexity of critical phenomena by introducing a crossover approach, which suggests a novel way to bridge different regimes of fluid behavior. The chronological progression to the 2012 paper 'Thermodynamics of supercooled water' indicates that the researcher extended this theoretical framework to specific, challenging states of matter, demonstrating the versatility and enduring relevance of the initial methodology.

The significance of this contribution is evidenced by the high citation counts of both the core paper and the follow-up work. Furthermore, the fact that nearly all citing papers originate from independent researchers underscores the broad adoption of these methods across the scientific community, confirming the work's impact beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 10 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Crossover approach to global critical phenomena in fluids

1992 · Physica A · 316 citations (GS)

Field-normalised: 193 Semantic Scholar citations place it in the top 5% of Physics papers from 1992 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Supercritical CO2: Properties and Technological Applications - A Review (2019)	Geothermal Research Institute of the Russian Academy of Sciences, Institute of Physics of the Dagestan Scientific Center of the Russian Academy of Sciences	Russia	—
2	Non-Equilibrium Phase Transitions: Volume I: Absorbing Phase Transitions (2008)	Humboldt-Universität zu Berlin, Université de Lorraine, University of Würzburg	France, Germany	—
3	Geometrical Percolation Threshold of Overlapping Ellipsoids (1995)	Arizona State University, National Institute of Standards and Technology	United States	—
4	UNIVERSAL SCALING BEHAVIOR OF NON-EQUILIBRIUM PHASE TRANSITIONS (2004)	Univerität Duisburg-Essen	Germany	—
5	A computer simulation study of the liquid–vapor coexistence curve of water (1993)	Université Pierre & Marie Curie	France	—

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

Thermodynamics of supercooled water

2012 · The Journal of Chemical Physics · 295 citations (GS)

Field-normalised: 227 Semantic Scholar citations place it in the top 5% of Physics papers from 2012 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	The role of local structure in dynamical arrest (2015)	Australian National University, University of Bristol	Australia, United Kingdom	—
2	Comparing machine learning potentials for water: Kernel-based regression and Behler–Parrinello neural networks (2024)	University of Vienna	Austria	**Influential**
3	Homogeneous Ice Nucleation at Moderate Supercooling from Molecular Simulation (2013)	Universidad Complutense de Madrid	Spain	—
4	Advances in Computational Studies of the Liquid–Liquid Transition in Water and Water-Like Models (2018)	Princeton University, Sapienza Universita' di Roma, St. Francis Xavier University	Canada, Italy, United States	—
5	Density isobar of water and melting temperature of ice: Assessing common density functionals (2024)	Toyota Central R & D Labs, University of Vienna	Austria	—

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 foundational theoretical framework for understanding critical phenomena in liquids and liquid crystals, as evidenced by a seminal monograph with substantial independent scholarly uptake.

CLAIM: The researcher's primary contribution is the development of a comprehensive theoretical treatment of critical phenomena in liquids and liquid crystals, anchored by the 1991 monograph published by CRC Press. This work serves as the central pillar of this specific line of inquiry, standing alone without subsequent follow-up publications by the researcher in this dataset.

ORIGINALITY: The publication of a dedicated monograph on this topic suggests the researcher addressed a need for a consolidated, rigorous theoretical synthesis of critical behavior in these complex fluid systems. By framing the work as a standalone authoritative text, the researcher appears to have provided a definitive reference point that clarified the underlying physics governing phase transitions and criticality in liquid crystalline materials.

SIGNIFICANCE: The enduring impact of this work is demonstrated by its citation count of 918, indicating it has become a standard reference in the field. Furthermore, the high degree of citation independence, with 97.6% of classified citations originating from independent researchers, underscores the work's broad acceptance and utility across the global scientific community, rather than reliance on self-citation or institutional networks.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 11

CORE PAPER

Critical Phenomena in Liquids and Liquid Crystals

1991 · CRC Press · 918 citations (GS)

Field-normalised: 515 Semantic Scholar citations place it in the top 1% of Physics papers from 1991 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Phase transitions in liquid crystals (2000)	Banaras Hindu University	India	—
2	Introduction to Liquid Crystals: Chemistry and Physics, Second Edition (2019)	Swarthmore College, University of York	United Kingdom, United States	—
3	Soft Matter Physics: An Introduction (2003)	Kent State University, Universities of Paris VI and VII	France, United States	—
4	The Specific Heat of Matter at Low Temperatures (2003)	—	—	—
5	Liquid Crystals: Fundamentals (2002)	Banaras Hindu University	India	—
6	Task-specific ionic liquid for solubilizing metal oxides (2006)	—	—	—
7	The Field Theoretic Renormalization Group in Critical Behavior Theory and Stochastic Dynamics (2004)	—	—	—
8	Nucleation Theory and Applications (2005)	Joint Institute for Nuclear Research (JINR), University of Rostock	Germany, Russia	—
9	Two-state thermodynamics and the possibility of a liquid-liquid phase transition in supercooled TIP4P/2005 water (2016)	Princeton University	United States	—
10	Critical phenomena and renormalization-group theory (2002)	Università di Pisa, Università di Roma "La Sapienza"	Italy	—
11	Liquid Crystals: Fundamentals (2002)	Banaras Hindu University	India	—

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

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Entropy-driven liquid–liquid separation in supercooled water

2012 · Scientific Reports · 299 citations (GS)

Field-normalised: 237 Semantic Scholar citations place it in the top 5% of Physics papers from 2012 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	The structural origin of anomalous properties of liquid water. (2015)	Stockholm University	Sweden	—
2	Water structure, properties and some applications – A review (2022)	Technical University of Denmark (DTU)	Denmark	—
3	Metastable liquid–liquid transition in a molecular model of water (2014)	Princeton University	United States	—
4	Ultrafast X-ray probing of water structure below the homogeneous ice nucleation temperature (2014)	Center for Free-Electron Laser Science, DESY, SLAC	Germany, Sweden, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
		National Accelerator Laboratory, Stockholm University		
5	Signatures of a liquid–liquid transition in an ab initio deep neural network model for water (2020)	Princeton University	United States	Methodology

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 Vienna	Austria	THE =95 · QS 152	4
Princeton University	United States	SCImago #386 · THE =3 · QS =25	4
Banaras Hindu University	India	SCImago #3422 · THE 501–600 · QS 1001-1200	3
Stockholm University	Sweden	SCImago #578 · THE 201–250 · QS =147	3
University of Maryland	United States	—	2
Università di Roma "La Sapienza"	Italy	—	1
Pohang University of Science and Technology	South Korea	SCImago #1045 · THE =141 · QS 102	1
Università di Bologna	Italy	—	1
RIKEN SPring-8 Center	Japan	—	1
Technical University of Denmark (DTU)	Denmark	SCImago #404 · THE 121 · QS 107	1
Center for Free-Electron Laser Science, DESY	Germany	—	1
Sapienza Universita' di Roma	Italy	—	1
Toyota Central R & D Labs	—	—	1
NIST	United States	—	1
KTH Royal Institute of Technology	Sweden	SCImago #497 · THE =98 · QS 78	1

Geographic distribution of citing authors

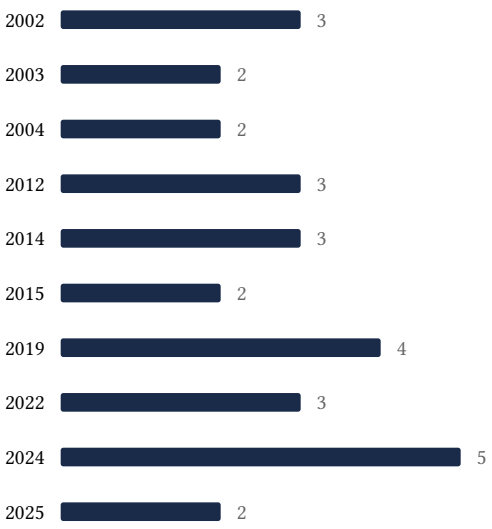
Country	Citing papers
United States	16
Germany	6
Japan	5
France	4
United Kingdom	4
Austria	4

Country	Citing papers
Italy	4
India	3
Sweden	3
Australia	2
Denmark	2
China	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	Crossover approach to global critical phenomena in fluids	10	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Critical Phenomena in Liquids and Liquid Crystals	11	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Entropy-driven liquid–liquid separation in supercooled water	5	Dhanasar — Prong 2 (well-positioned)