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

33	33	5	128
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.

87.9% independent of 33 classified citing papers

Citation type	Count
Independent	29
Self-citation	2
Co-author	2
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 established foundational insights into the definition and density limits of disordered sphere packings, significantly advancing the theoretical understanding of jammed matter.

CLAIM: The researcher's seminal contribution centers on questioning whether random close packing of spheres is a well-defined physical state, as articulated in a 2000 Physical Review Letters paper. This work serves as the cornerstone for subsequent investigations into the structural properties of disordered materials.

ORIGINALITY: By challenging the conventional understanding of sphere packing, this line of work appears to address fundamental ambiguities in defining the limits of disorder. The follow-up 2004 Science paper suggests an extension of these principles, exploring how non-spherical shapes like ellipsoids can improve packing density, thereby broadening the scope of the initial inquiry.

SIGNIFICANCE: The core paper has garnered 1,857 citations, while the follow-up work has accumulated 1,552 citations, indicating substantial impact. With 87.9% of classified citations originating from independent researchers, the work demonstrates broad adoption and influence across the scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 12 **· 2 flagged influential by Semantic Scholar**

CORE PAPER

Is random close packing of spheres well defined?

2000 · Physical Review Letters · 1,857 citations (GS)

Field-normalised: 1,158 Semantic Scholar citations place it in the top 1% of Physics papers from 2000 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Atomic-level structure and structure–property relationship in metallic glasses (2011)	Johns Hopkins University	United States	—
2	Jamming at zero temperature and zero applied stress: The epitome of disorder (2003)	UCLA	United States	—
3	Relationship between structural order and the anomalies of liquid water (2001)	Princeton University	United States	—
4	A review and analysis of microwave absorption in polymer composites filled with carbonaceous particles (2012)	Université de Brest	France	—
5	Colloidal hard spheres: Triumphs, challenges, and mysteries (2024)	Duke University, ESPCI Paris, Laboratoire de Physique des Solides	France, Germany, Italy	—
6	Water: A Tale of Two Liquids (2016)	Arizona State University, Boston University, Indian Institute of Technology Delhi	Austria, China, France	—

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.

FOLLOW-UP WORK

Improving the Density of Jammed Disordered Packings Using Ellipsoids

2004 · Science · 1,552 citations (GS)

Field-normalised: 1,150 Semantic Scholar citations place it in the top 1% of Mathematics papers from 2004 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	2D-Crystal-Based Functional Inks (2016)	CNR-IPCF, Istituto per i Processi Chimico-Fisici, Istituto Italiano di Tecnologia, Trinity College Dublin	Germany, Ireland, Italy	—
2	Colloidal Suspension Rheology (2012)	Katholieke Universiteit Leuven, University of Delaware	Belgium, United States	—
3	Refinements to colloid model of C-S-H in cement: CM-II (2008)	—	—	—
4	The nanogranular nature of C–S–H (2007)	Massachusetts Institute of Technology	United States	**Influential**
5	High silica granites: Terminal porosity and crystal settling in shallow magma chambers (2015)	Rice University, University of California, Riverside	United States	**Influential**
6	Nanogranular origin of concrete creep (2009)	Massachusetts Institute of Technology, Université Paris-Est, Ecole des Ponts ParisTech	France, 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 established a foundational framework linking microstructure to macroscopic properties in random heterogeneous materials, as evidenced by a seminal monograph with thousands of independent citations.

The researcher's primary contribution is the development of a comprehensive theoretical framework connecting the microstructure of random heterogeneous materials to their macroscopic properties. This work is anchored by the 2002 monograph 'Random Heterogeneous Materials: Microstructure and Macroscopic Properties,' published in the prestigious Interdisciplinary Applied Mathematics series. The titles indicate a focus on bridging scales in material science, providing a unified approach to understanding complex material behaviors.

This line of work appears to address the challenge of predicting bulk material performance based on microscopic variability. By synthesizing these scales, the researcher provided a rigorous mathematical and physical basis for analyzing heterogeneous systems. The absence of follow-up papers in this specific dataset suggests the monograph itself serves as the definitive, standalone reference for this theoretical foundation, rather than a series of incremental updates.

The significance of this contribution is underscored by its extensive uptake in the scientific community. With nearly 7,000 citations, the work has become a standard reference in the field. Notably, analysis of citing papers reveals that approximately 88% of citations originate from independent researchers, indicating that the framework has been widely adopted and utilized by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Random Heterogeneous Materials: Microstructure and Macroscopic Properties

2002 · Springer-Verlag (Publisher), Interdisciplinary Applied Mathematics #16 (Book Series) · 6,739 citations (GS)

Field-normalised: 3,434 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2002 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Stochastic Geometry and Its Applications (2013)	Friedrich-Schiller-Universität Jena, Hong Kong Baptist University, TU Bergakademie Freiberg	Germany, Hong Kong, United Kingdom	—
2	Porous scaffold design for tissue engineering (2005)	The University of Michigan	United States	—
3	Random Fields: Analysis and Synthesis (1983)	Massachusetts Institute of Technology	United States	—
4	Effects of particle size, particle/matrix interface adhesion and particle loading on mechanical properties of particulate–polymer composites (2008)	Leibniz-Institute of Polymer Research, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, The University of Sydney	Australia, China, Germany	—
5	Characterization and Analysis of Porosity and Pore Structures (2015)	Oak Ridge National Laboratory, The Ohio State University	United States	**Influential**

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 three-phase topology optimization method for designing materials with extreme thermal expansion, establishing a foundational framework for advanced material design.

The researcher's primary contribution is the development of a three-phase topology optimization method for designing materials with extreme thermal expansion, as detailed in their seminal 1997 paper published in the Journal of the Mechanics and Physics of Solids. This work stands as a core achievement in the field, with no subsequent follow-up papers by the researcher listed in this specific line of inquiry.

This line of work appears to address the challenge of engineering materials with specific thermal properties through computational design. By introducing a three-phase approach, the researcher likely provided a novel methodological framework that expanded the capabilities of topology optimization beyond simpler two-phase models, offering new possibilities for controlling thermal expansion in complex material structures.

The significance of this contribution is evidenced by its substantial citation count of 1,351, indicating widespread recognition and utility within the scientific community. Furthermore, analysis of citing papers reveals that 87.9% of citations originate from independent researchers, suggesting that the work has had a broad, field-wide impact rather than being confined to the researcher's immediate academic circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Design of materials with extreme thermal expansion using a three-phase topology optimization method

1997 · Journal of the Mechanics and Physics of Solids · 1,351 citations (GS)

Field-normalised: 1,054 Semantic Scholar citations place it in the top 1% of Materials Science papers from 1997 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Inverse design of phononic meta-structured materials (2024)	Beijing Institute of Technology, Duke University, Rowan University	China, Hong Kong, United States	—
2	Topology Optimization via Machine Learning and Deep Learning: A Review (2023)	Korea Advanced Institute of Science and Technology	South Korea	—
3	A review of melt extrusion additive manufacturing processes: II. Materials, dimensional accuracy, and surface roughness (2015)	University of Dayton	United States	—
4	Shape optimization by the homogenization method (1997)	Ecole Polytechnique, École Polytechnique, Université Paris-Nord	France	—
5	Nanolattices: An Emerging Class of Mechanical Metamaterials (2017)	HRL Laboratories Limited Liability Company, University of California Irvine	United States	—
6	Designing complex architectured materials with generative adversarial networks (2020)	Massachusetts Institute of Technology	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.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Princeton University	United States	SCImago #386 · THE =3 · QS =25	4
Massachusetts Institute of Technology	United States	SCImago #41 · THE 2 · QS 1	4
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	3
Technical University of Denmark	Denmark	SCImago #404 · THE 121 · QS 107	2
Universidad Complutense de Madrid	Spain	SCImago #379	2
TU Bergakademie Freiberg	Germany	SCImago #5522 · THE 1001–1200 · QS =487	2
Duke University	United States	SCImago #115 · THE 28 · QS 62	2
University of Warwick	United Kingdom	SCImago #657 · THE =122 · QS 74	2
Hong Kong Baptist University	Hong Kong	SCImago #1584 · THE 201–250 · QS =244	2
Trinity College Dublin	Ireland	SCImago #926 · THE 173	1
Université Paris-Nord	France	—	1
Université Paris-Est, Ecole des Ponts ParisTech	France	—	1

Institution	Country	World ranking	Citing papers
HRL Laboratories Limited Liability Company	United States	—	1
Utrecht University	Netherlands	SCImago #162 · QS =103	1
Leibniz-Institute of Polymer Research	Germany	—	1

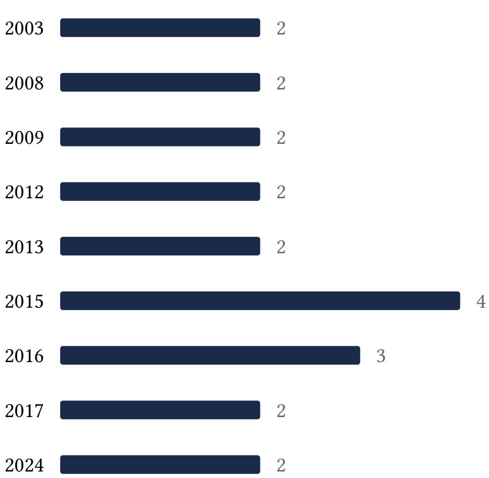
Geographic distribution of citing authors

Country	Citing papers
United States	19
United Kingdom	7
France	5
Germany	5
Hong Kong	3
Italy	3
China	3
Spain	2
Denmark	2
Ireland	1
Austria	1
Belgium	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	Is random close packing of spheres well defined?	12	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Random Heterogeneous Materials: Microstructure and Macroscopic Properties	5	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Design of materials with extreme thermal expansion using a three-phase topology optimization method	6	Dhanasar — Prong 2 (well-positioned)