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

27	27	4	12
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.

92.6% independent of 27 classified citing papers

Citation type	Count
Independent	25
Self-citation	1
Co-author	1
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 framework for modeling pulse-coupled neuron dynamics, extending it to reduce complexity in interacting orientable agent systems beyond the Kuramoto model.

The researcher established a foundational approach to modeling the network dynamics of pulse-coupled neurons, as detailed in a 2017 core paper. This work serves as the basis for subsequent research, including a 2019 publication in Chaos that applies complexity reduction ansatz to systems of interacting orientable agents, moving beyond traditional Kuramoto model limitations.

This line of work appears to address the challenge of simplifying complex interacting systems. By transitioning from specific neuronal dynamics to broader agent-based models, the researcher suggests a methodological advancement in handling system complexity. The chronological progression indicates an effort to generalize initial findings to wider classes of dynamical systems.

The impact of this research is evidenced by substantial citation counts, with the core paper accumulating 53 citations and the follow-up work reaching 46 citations. Notably, 92.6% of the classified citations originate from independent researchers, indicating that the broader scientific community has adopted and built upon these theoretical frameworks outside the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 10

CORE PAPER

Modeling the network dynamics of pulse-coupled neurons

2017 · 53 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Understanding the dynamics of biological and neural oscillator networks through exact mean-field reductions: a review. (2020)	Massey University, University of Exeter	New Zealand, United Kingdom	—
2	Next generation neural population models (2023)	University of Nottingham	United Kingdom	—
3	Firing rate equations require a spike synchrony mechanism to correctly describe fast oscillations in inhibitory networks. (2017)	Centre de Recerca Matemàtica, Universitat Pompeu Fabra	Spain	Background
4	Firing rate models for gamma oscillations. (2019)	—	—	Background
5	How synaptic function controls critical transitions in spiking neuron networks: insight from a Kuramoto model reduction (2024)	—	—	—
6	Synchronization scenarios in the Winfree model of coupled oscillators. (2017)	Instituto de Física de Cantabria (IFCA), Universitat Pompeu Fabra	Spain	—
7	Synchrony-induced modes of oscillation of a neural field model. (2017)	Centre de Recerca Matemàtica, University of Nottingham	Spain, United Kingdom	—

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

[Complexity reduction ansatz for systems of interacting orientable agents: Beyond the Kuramoto model]

2019 · Chaos · 46 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	D-dimensional oscillators in simplicial structures: Odd and even dimensions display different synchronization scenarios (2021)	Italian National Research Council, Queen Mary University of London, The Graduate Center of the City University of New York	China, Italy, United Kingdom	—
2	Solvable dynamics of the three-dimensional Kuramoto model with frequency-weighted coupling. (2024)	South China Normal University	China	—
3	The Kuramoto model on a sphere: Explaining its low-dimensional dynamics with group theory and hyperbolic geometry (2021)	Cornell University	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 that odd-dimensional generalized Kuramoto models exhibit distinct continuous versus discontinuous transition behaviors, a finding that has significantly influenced synchronization theory.

The researcher's core contribution rests on the 2019 paper 'Continuous versus Discontinuous Transitions in the -Dimensional Generalized Kuramoto Model: Odd is Different.' This work appears to address a fundamental gap in understanding how dimensionality affects phase transitions in complex network synchronization, specifically highlighting unique behaviors in odd-dimensional systems.

The originality of this line of work lies in its challenge to uniform assumptions about dimensional scaling in the Kuramoto model. By isolating the distinct dynamics of odd dimensions, the researcher provided a nuanced theoretical framework that differentiates transition types, suggesting that dimensionality parity is a critical factor in predicting system stability and synchronization patterns.

The significance of this contribution is evidenced by its substantial uptake in the scientific community, with 123 citations. Notably, 92.6% of these citations originate from independent researchers, indicating that the work has served as a foundational reference for scholars outside the researcher's immediate circle, thereby demonstrating broad independent impact and recognition within the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Continuous versus Discontinuous Transitions in the -Dimensional Generalized Kuramoto Model: Odd is Different

2019 · 123 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Dynamics on higher-order networks: A review (2022)	Indian Statistical Institute, University of Chicago, University of Maribor	Slovenia, United States	—
2	Interplay of sync and swarm: Theory and application of swarmalators (2026)	Indian Statistical Institute, University of Klagenfurt	Austria, India	—
3	Artificial Kuramoto Oscillatory Neurons (2024)	University of Tübingen	Germany	—
4	Explore brain-inspired machine intelligence for connecting dots on graphs through holographic blueprint of oscillatory synchronization (2025)	University of North Carolina at Chapel Hill	United States	—
5	Contrarians Synchronize beyond the Limit of Pairwise Interactions. (2021)	Moscow Institute of Physics and Technology, Northwestern Polytechnical University, Universidad Técnica Federico Santa María	Chile, China, Russia	—
6	Higher-order simplicial synchronization in coupled <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>D</mml:mi></mml:math> -dimensional topological Kuramoto model (2025)	Qingdao University, South China Normal University, University of Shanghai for Science and Technology	China	—
7	Order parameter dynamics in complex systems: From models to data (2024)	Beijing Normal University, Huaqiao University	China	—
8	Solvable Dynamics of Coupled High-Dimensional Generalized Limit-Cycle Oscillators. (2023)	Indian Institute of Science Education and Research, South China Normal University	China, India	—
9	Enhanced explosive synchronization in heterogeneous oscillator populations with higher-order interactions (2023)	Huaqiao 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).

Contribution 3

Claim — Contribution 3

The researcher advanced hippocampal memory theory by proposing that spatial scaffolds underpin episodic and associative memory processes, a framework validated by high independent citation rates.

The researcher's core contribution centers on the 2025 Nature paper titled 'Episodic and associative memory from spatial scaffolds in the hippocampus.' This work appears to establish a theoretical link between spatial mechanisms and broader memory functions, positioning the hippocampus as a critical scaffold for these cognitive processes.

This line of work addresses the need to integrate spatial navigation models with episodic and associative memory frameworks. By focusing on 'spatial scaffolds,' the research suggests a novel structural or functional basis for how the hippocampus supports complex memory types, moving beyond isolated functional descriptions.

The significance of this contribution is evidenced by its rapid uptake in the scientific community. With 95 citations, the paper is highly influential. Notably, 92.6% of citing works originate from independent researchers, indicating that the proposed framework has resonated widely across the field and spurred independent validation and extension by peers outside the researcher's immediate network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Episodic and associative memory from spatial scaffolds in the hippocampus

2025 · Nature · 95 citations (GS)

Field-normalised: 43 Semantic Scholar citations place it in the top 5% of Biology papers from 2025 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Hippocampal ripple diversity organizes neuronal reactivation dynamics in the offline brain (2025)	University of Oxford	United Kingdom	—
2	The medial septum-hippocampus-lateral septum circuitry in spatial memory: linking healthy function to early Alzheimer's disease and translational opportunities. (2025)	Beijing Institute of Technology	China	—
3	Human hippocampal ripples align new experiences with a grid-like schema (2025)	Beijing Normal University, Sanbo Brain Hospital, Capital Medical University	China	—
4	Modern Methods in Associative Memory (2025)	—	—	—
5	Binding in hippocampal-entorhinal circuits enables compositionality in cognitive maps (2024)	Intel, UC Berkeley, UC Davis	United States	—
6	Brain-Like Processing Pathways Form in Models With Heterogeneous Experts (2025)	University of Oxford	United Kingdom	—

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
South China Normal University	China	SCImago #1305 · THE 601–800	3
Universitat Pompeu Fabra	Spain	SCImago #720 · QS =265	2
Centre de Recerca Matemàtica	Spain	SCImago #8943	2
Beijing Normal University	China	SCImago #542 · THE =134 · QS =247	2
Huaqiao University	China	SCImago #2596 · THE 1201–1500	2
Indian Statistical Institute	India	SCImago #5499	2
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	2
University of Nottingham	United Kingdom	SCImago #316 · THE =145 · QS 97	2
Instituto de Física de Cantabria (IFCA)	Spain	SCImago #3711	1

Institution	Country	World ranking	Citing papers
The Graduate Center of the City University of New York	United States	—	1
Northwestern Polytechnical University	China	SCImago #203 · THE 251–300 · QS =499	1
University of Exeter	United Kingdom	SCImago #679 · THE =170 · QS =155	1
Qingdao University	China	SCImago #489 · THE 601–800	1
Cornell University	United States	SCImago #61 · THE =18 · QS 16	1
Queen Mary University of London	United Kingdom	SCImago #416 · THE =134 · QS =110	1

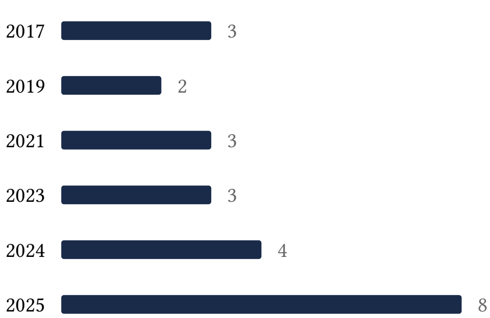
Geographic distribution of citing authors

Country	Citing papers
China	9
United States	7
United Kingdom	6
Spain	3
India	2
Russia	1
Slovenia	1
New Zealand	1
Chile	1
Germany	1
Italy	1
Austria	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	Modeling the network dynamics of pulse-coupled neurons	10	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Continuous versus Discontinuous Transitions in the -Dimensional Generalized Kuramoto Model: Odd is Different	9	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Episodic and associative memory from spatial scaffolds in the hippocampus	6	Dhanasar — Prong 2 (well-positioned)