



Photography as a Quantum Information System and the 2025 Nobel Prize in Physics: A Synthesis

José L. Mac Loughlin & Norma G. Sánchez

The Photography: first Macroscopic Quantum System (Paris 1839), Bridge between the quantum microscopic and the Macroscopic within reach of a hand, the size of a hand, placed in the hands (Organum Organorum) of any human being

The 2025 Nobel Prize in Physics recognized the experimental demonstration that macroscopic systems can exhibit coherent quantum behavior, bridging the gap between the microscopic and classical worlds. In this context, the work of J. L. Mac Loughlin and N. G. Sánchez on Photography as a Quantum Information System offers

a parallel and complementary conceptual contribution by reinterpreting photography as a quantum physical-information process.

The work of Mac Loughlin & Sánchez (2023-2024)

According to their work, photography is not merely an optical technique but a system of quantum measurement and information recording. The photographic process—from the interaction of light with the object, the formation of the quantum “negative state,” to the final dual classical “positive state” image—can be described as a sequence and superposition of quantum states of information and entropy.

In this view, the image is measured in qubits of information, the surface is directly associated with the amount of recorded information, following an entropy–area relation analogous to that found in the thermodynamics of quantum systems, in the holographic principle and in black holes.

The work of Mac Loughlin and Sánchez place quantum information as the essential link between observation, measurement, and image representation. Thus, the photographic process becomes a conceptual model of how a physical system can capture, encode, and preserve quantum information, transforming it into a macroscopic state manifestation.

Conceptual Correspondences

This theoretical formulation connects with the results recognized by the 2025 Nobel Prize in Physics, which experimentally demonstrate the manifestation of quantum properties in macroscopic systems—such as coherence, superposition, and tunneling effects observable at large scale.

Both approaches—the experimental work acknowledged by the Nobel and the conceptual framework of Mac Loughlin and Sánchez—converge in the same direction: the emergence of the quantum in the macroscopic domain and the understanding of physical reality as a continuum of quantum information.

Implications

The implications of this convergence are broad. On one hand, it recognizes that measurement and recording processes (photography, sensors, superconducting circuits) can share a common quantum foundation; on the other, it opens the possibility of extending these principles to quantum computation, metrology, and artificial intelligence systems that treat information as a physical entity.

In summary, Photography as a Quantum Information System proposes a unifying language that allows phenomena—from photographic registration to macroscopic quantum systems—to be described in terms of information, entropy, and coherence, providing a conceptual basis for understanding quantum reality at large scales.

Table - Synthesis

Title

Photography as a Quantum Information System ↔ Macroscopic Quantum Systems - Nobel Prize in Physics 2025

1. Marco general

Contemporary quantum physics: macroscopic systems can exhibit quantum coherence.

Quantum photography: the act of photography is interpreted as a process of quantum measurement and information.

2. Proposal of J. L. Mac Loughlin & N. G. Sánchez

The Photography is and is formulated as a quantum information system.

Each phase of the process (capture → negative → positive, wave function) corresponds to a state of information/entropy.

The area of the image is proportional to the amount of information → analogy with holographic laws (surface-entropy).

3. Connection with macroscopic quantum systems (Nobel 2025)

Both systems reveal how the quantum emerges on a macroscopic scale. -

In **the Nobel Prize-winning experiments**, physical circuits demonstrate quantum coherence. **In photography**, the image is the visible manifestation of a quantum measurement process.

4. Conceptual correspondences

Quantum Photography (Mac Loughlin & Sánchez) ↔ Macroscopic Quantum Systems (Nobel 2025)

- **Nature:** Quantum information system ↔ Observable quantum physical system

- **Record:** Image (entropy-surface) ↔ Macroscopic coherent signal or state -

Measurement: Observation and collapse process ↔ Detection of macroscopic quantum states

-**Scale:** Quantum–visual ↔ Quantum–physical

- **Purpose:** Understanding physical information ↔ Extending the quantum domain

5. Implications

Metrology and sensors: new interpretation of physical recording as quantum measurement.

Quantum computing and AI: coding models inspired by photography.

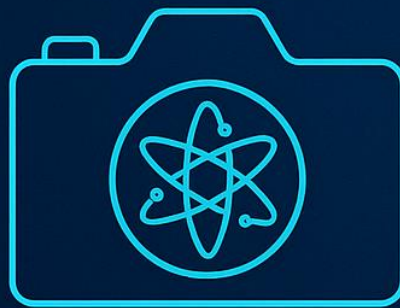
Philosophy of physics: reality as a continuous quantum information structure.

6. Conclusion

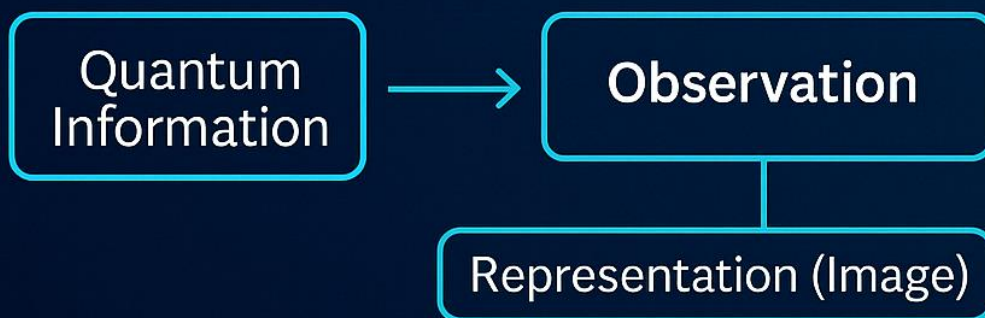
Both approaches show that the boundary between the quantum and the macroscopic dissolves.

The quantum photography framework of Mac Loughlin and Sánchez provides a unifying conceptual language for understanding quantum information in observable systems.

Relationship Between Photography as a Quantum Information System and Macroscopic Quantum Systems (Nobel Prize in Physics 2025)

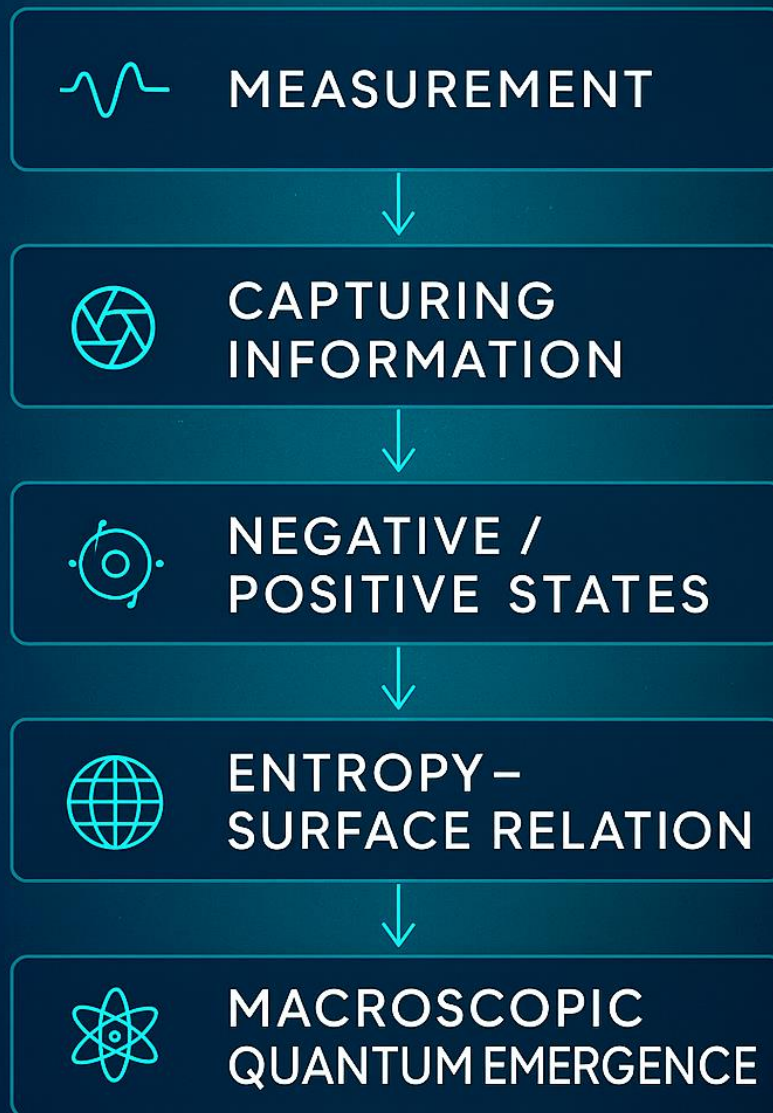


Photography acts as a quantum information system bridging microscopic measurement and macroscopic reality.



J. L. Mac Loughlin N. G. Sánchez

QUANTUM INFORMATION FLOW IN THE PHOTOGRAPHIC SYSTEM



Sequential representation of quantum information states within the photographic process.

J. L. Mac Loughlin N. G. Sánchez

Conceptual Correspondences and Implications

Quantum Photography	Macroscopic Quantum Systems
Nature Quantum information system	Observable physical system
Record Image (entropy – surface)	Macroscopic coherent signal
Measurement Observation/collapse	Detection of quantum states
Scale Quantum–visual	Quantum–physical

Implications



Metrology
& Sensors



Quantum
Computing
& AI



Philosophy
of Physics

Both frameworks dissolve the classical–quantum boundary, revealing information as the fabric of reality.

J. L. Mac Loughlin & N. G. Sánchez

References:

[1] José Luis Mac Loughlin, Norma G. Sanchez, *"New Conceptual Approach to Photography as a Quantum Information System (English version)"*,

Researchgate Publication/375745724 (2023)

<https://www.researchgate.net/publication/375745724>

<https://chalonge->

[vevega.fr/NUEVA VISION DE LA FOTOGRAFIA UN SISTEMA CUANTICO.pdf](https://chalonge-vevega.fr/NUEVA_VISION_DE_LA_FOTOGRAFIA_UN_SISTEMA_CUANTICO.pdf)

<https://chalonge-vevega.fr/TexteMagazine.pdf>

<https://chalonge-vevega.fr/3MAGAZINEParlementEuropee.jpg>

<https://undav.edu.ar/index.php?idcateg=323&id=36774>

<https://editorapi9.com.ar/nuevo-enfoque-conceptual-de-la-fotografia-como-un-sistema-cuantico/>

<https://www.eldia.com/nota/2024-2-4-3-12-38-revelar-el-mundo-la-cuantica-a-un-clic-de-distancia-informacion-general>

Entrevista Cuantica Interdisciplinaria al Prof. José Luis Mac Loughlin y a la Dra Norma Graciela Sanchez , TV Somos 2024

<https://www.youtube.com/watch?v=QEVVS4pXKsM>

<https://capital24.com.ar/contenido/2773/dos-eminencias-de-nuestra-region-y-un-nuevo-enfoque-conceptual-la-fotografia-com>

<https://lagrancapital.com/2024/02/13/una-revelacion-de-impacto-mundial/>

<https://www.youtube.com/watch?v=1TofCnmOiE>

<https://www.youtube.com/watch?v=ne50hry7Klc>

[2] José Luis Mac Loughlin, Norma G. Sanchez

Nuevo Sistema Cuantico de Información y Medición (II) y (III) : El Cinema

<https://www.researchgate.net/publication/377301119>

<https://www.researchgate.net/publication/377301131>

[3] Nobel Prize in Physics 2025 : John Clarke, Michel H. Devoret and John M. Martinis for the experimental discovery of macroscopic quantum mechanical tunnelling and energy quantisation in an electric circuit

<https://www.nobelprize.org/prizes/physics/2025/prize-announcement/>

<https://www.nobelprize.org/prizes/physics/2025/popular-information/>

<https://www.nobelprize.org/uploads/2025/10/advanced-physicsprize2025.pdf>

J. L. Mac Loughlin & N. G. Sánchez
2025

*Inspired by the connection between
Quantum Information Systems and
Macroscopic Quantum Phenomena
(Nobel Prize in Physics 2025).*

Quantum Information & Cosmology
Project – 2025