

Diamantes para Sensado Cuántico

FAMAF



RRAFTA 2025

Fernando
Meneses

Esquema



Breve teoría



Dispositivos experimentales

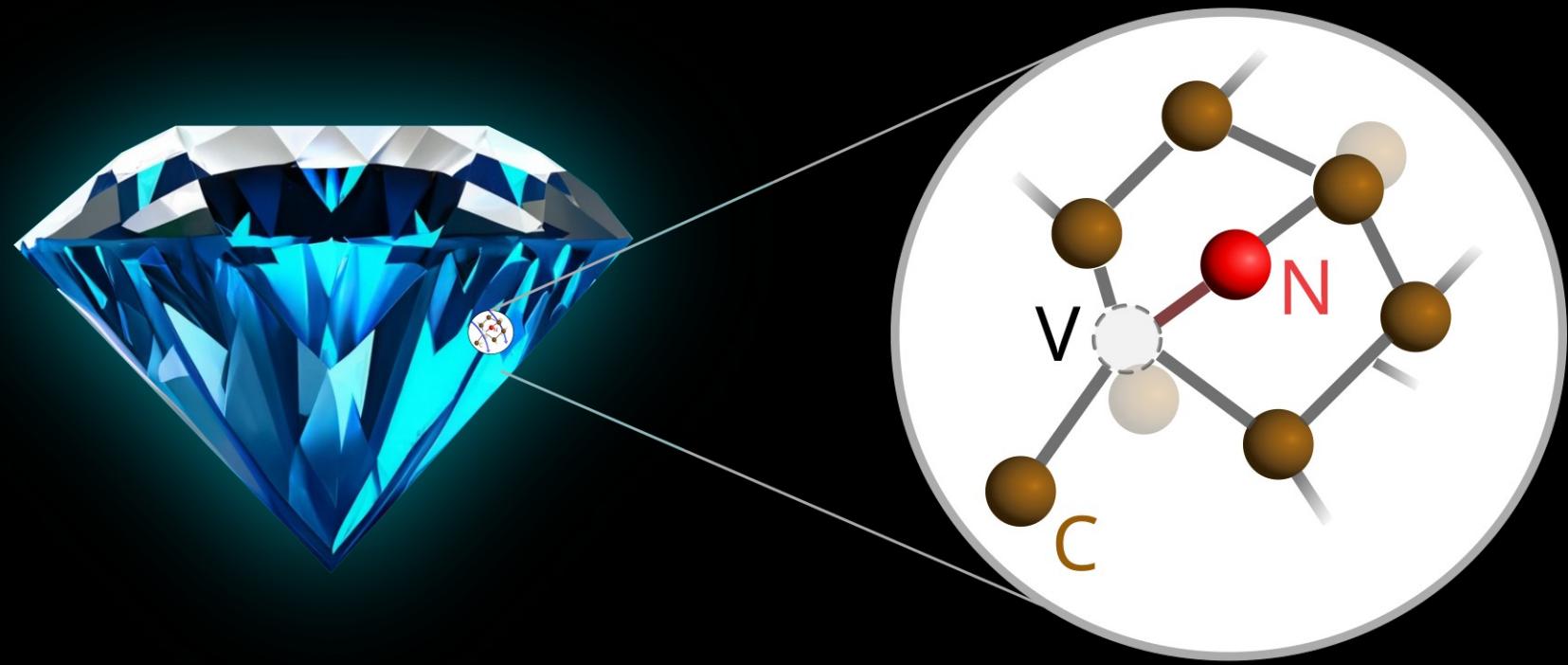


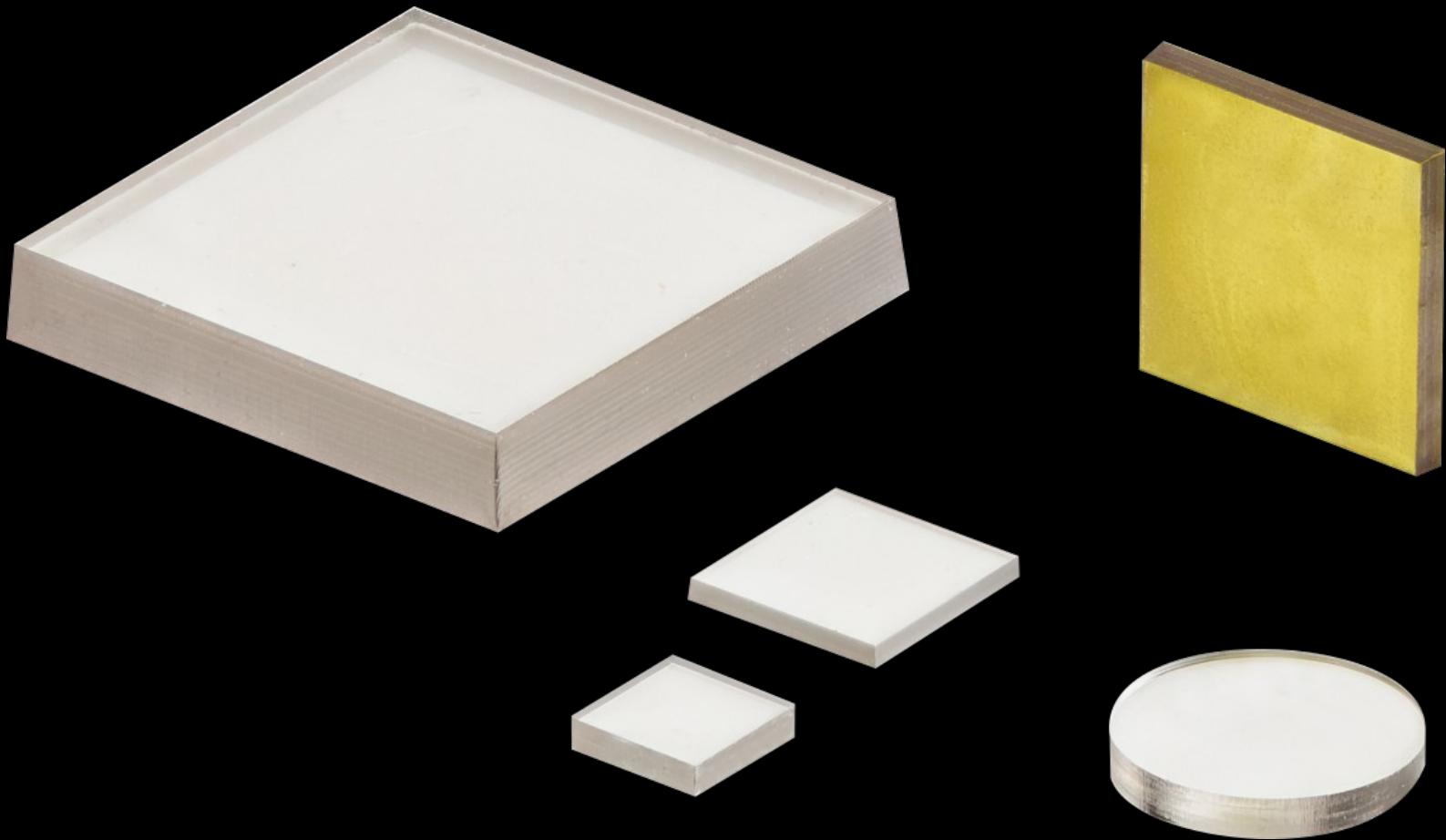
Aplicaciones



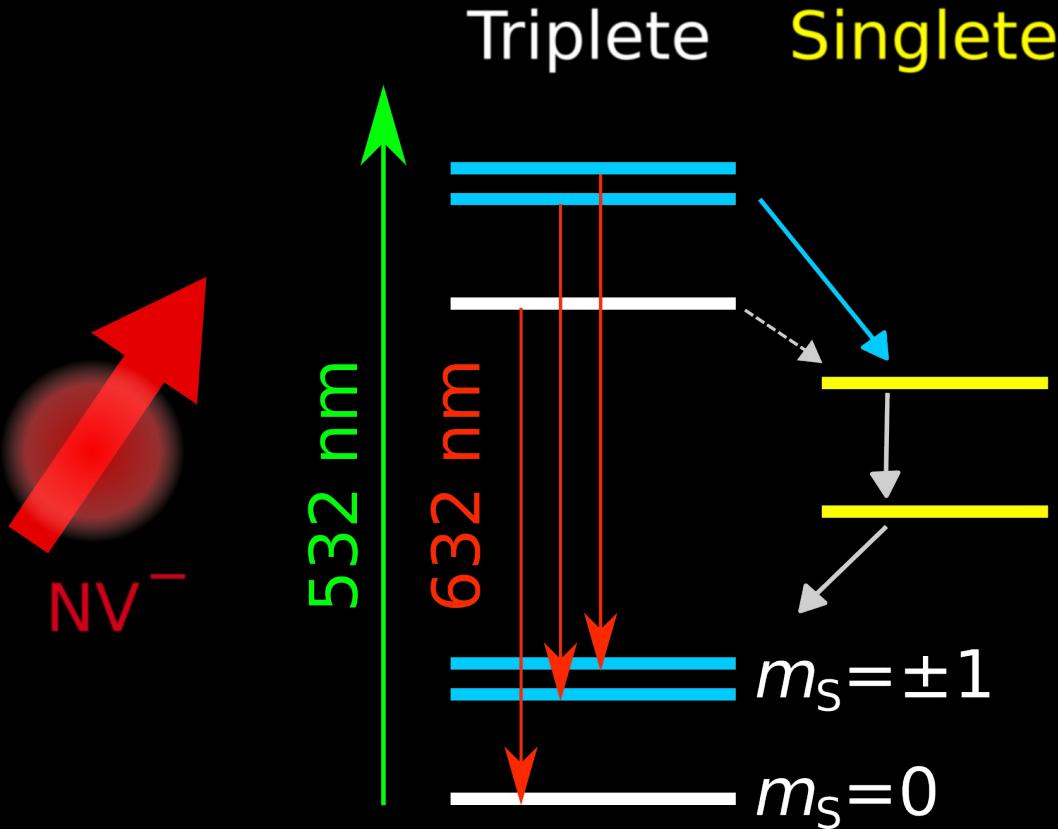
Resumen

¿Qué son los defectos NV?



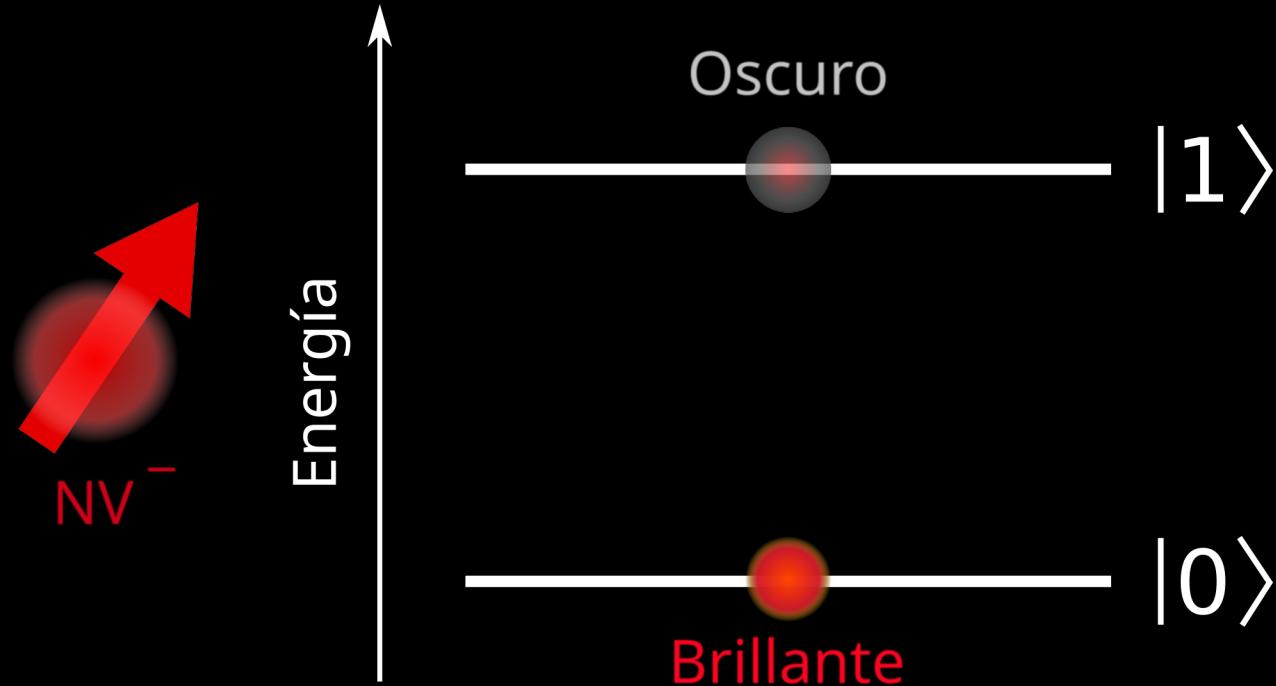


Niveles cuánticos

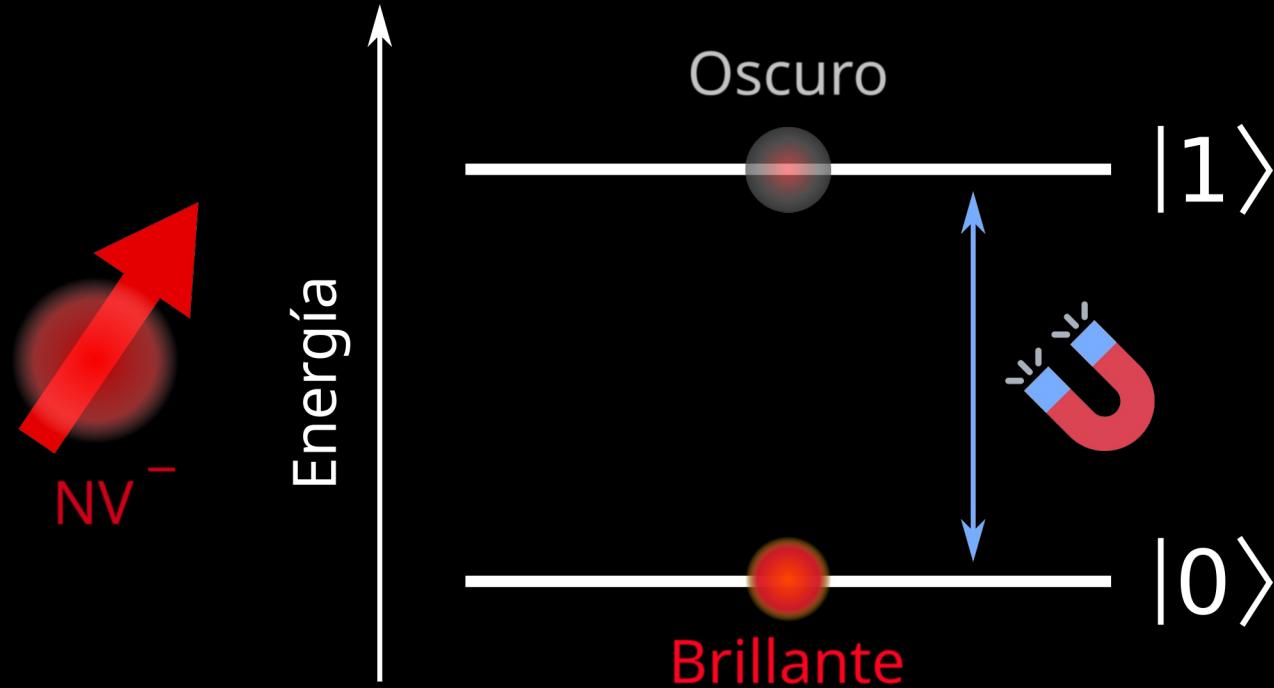




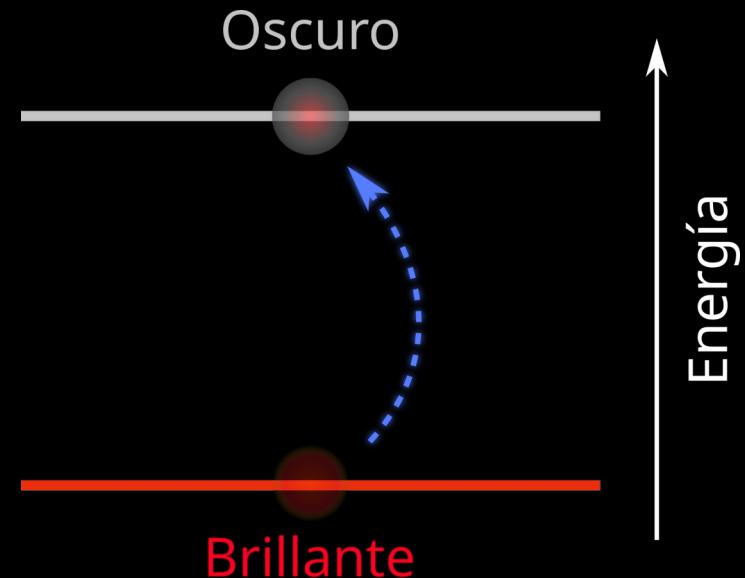
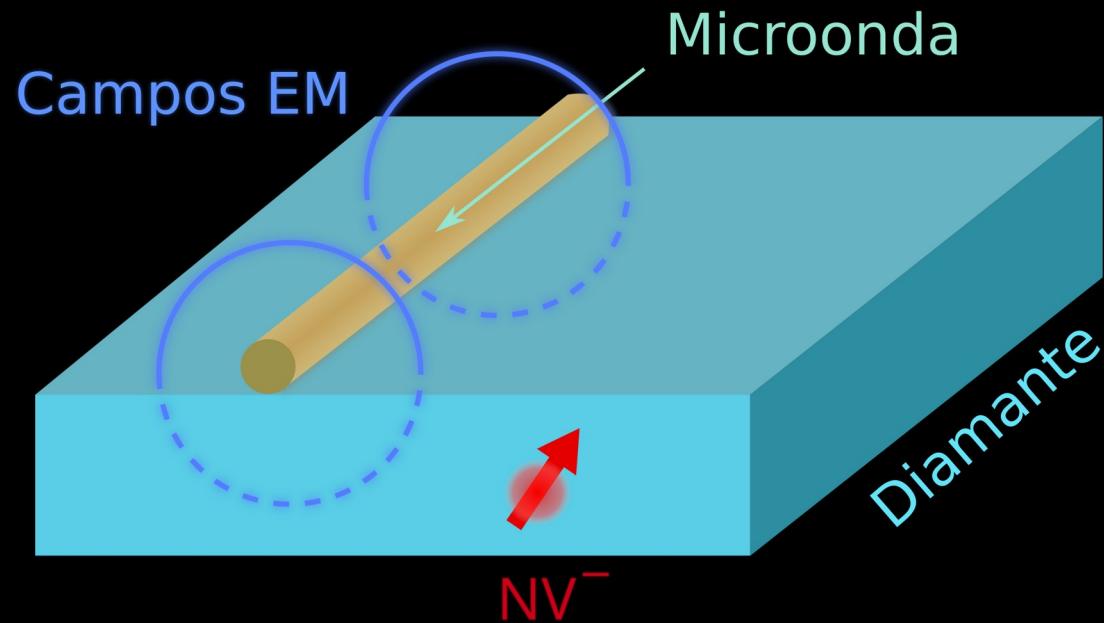
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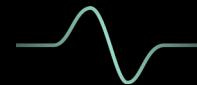
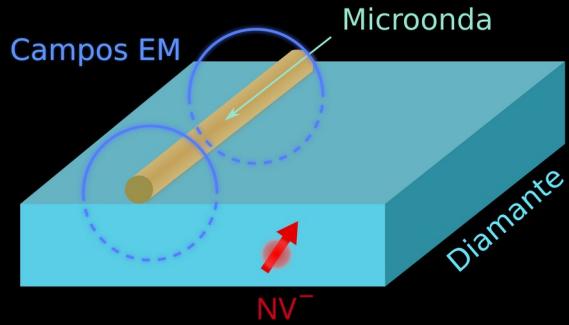
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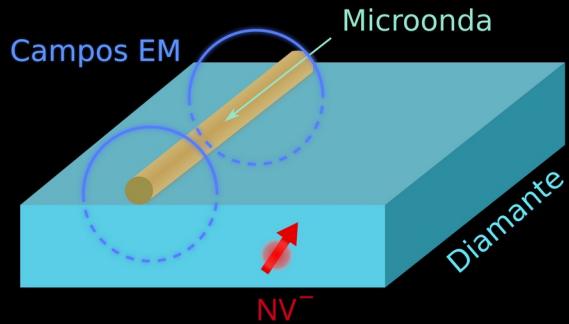
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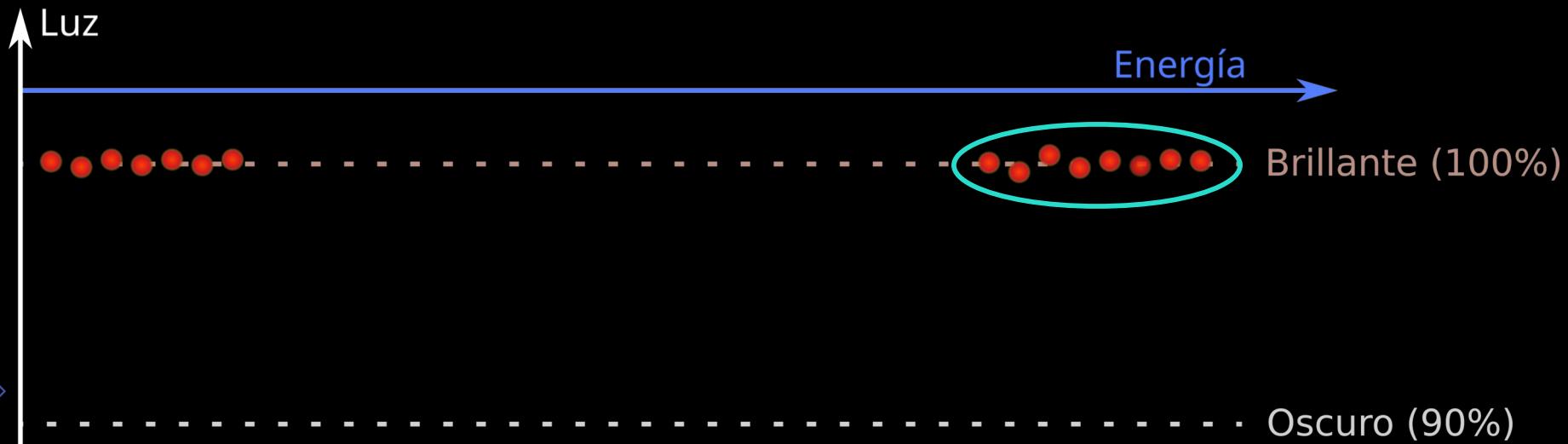
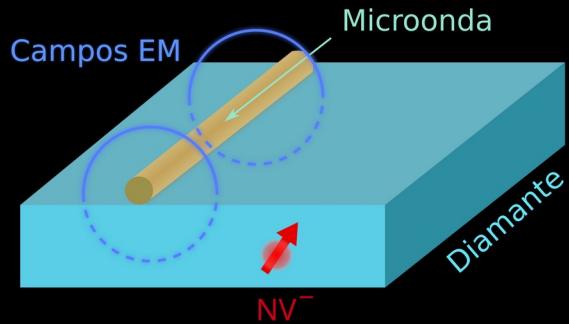
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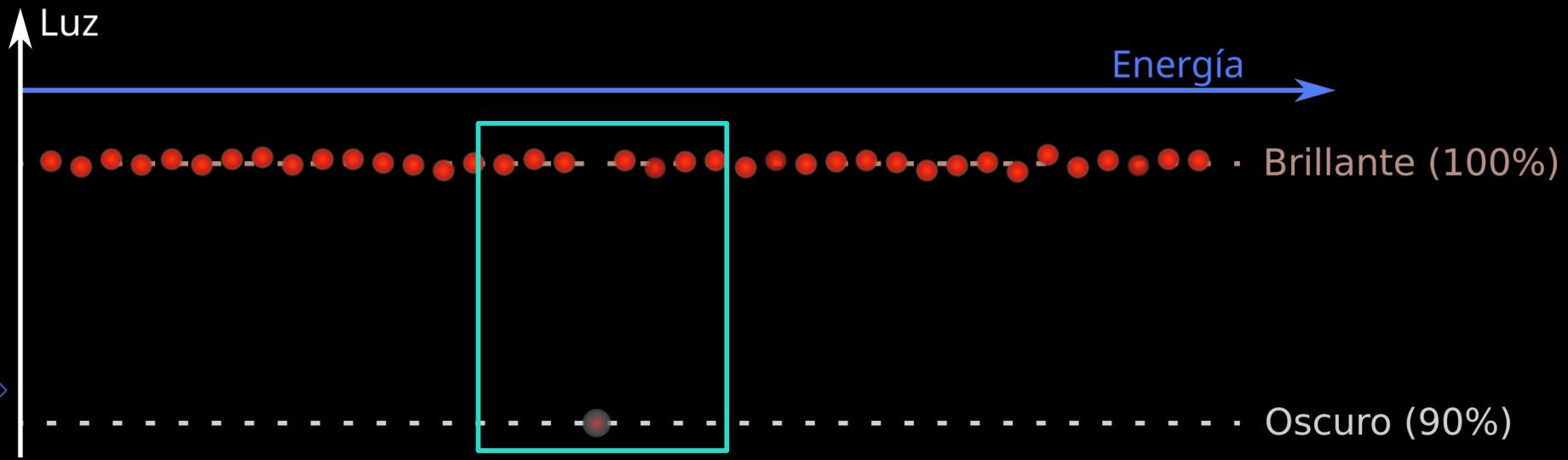
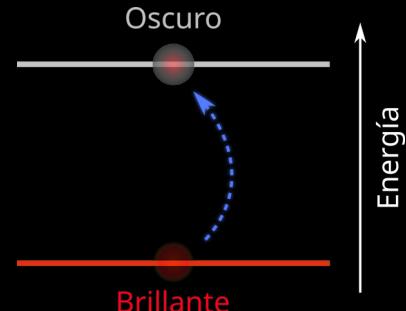
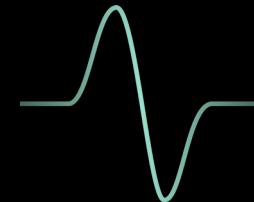
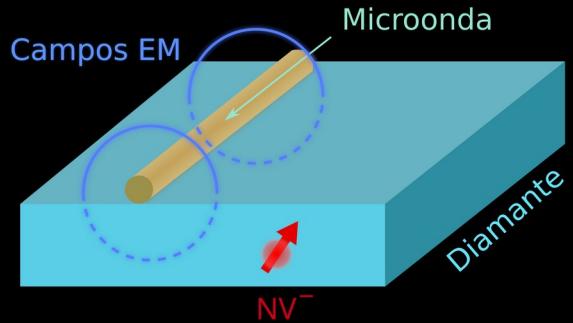
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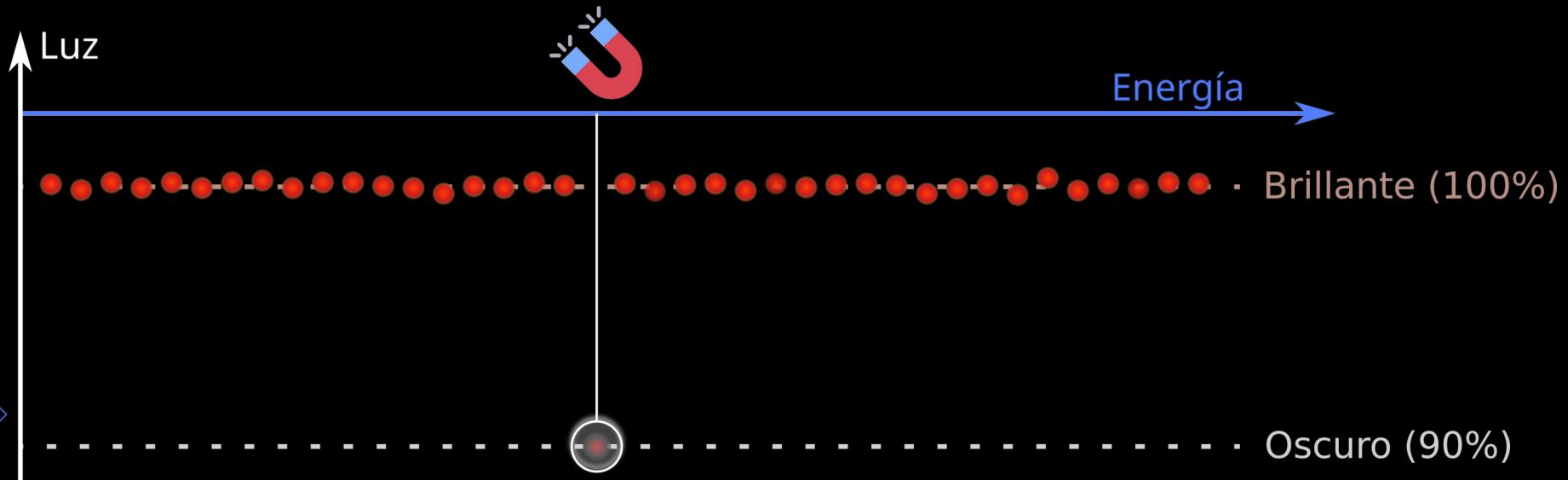
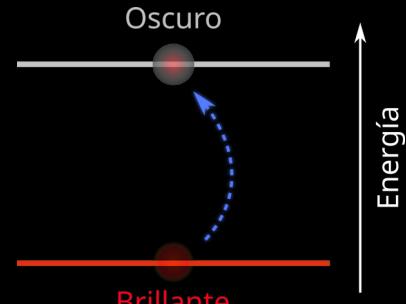
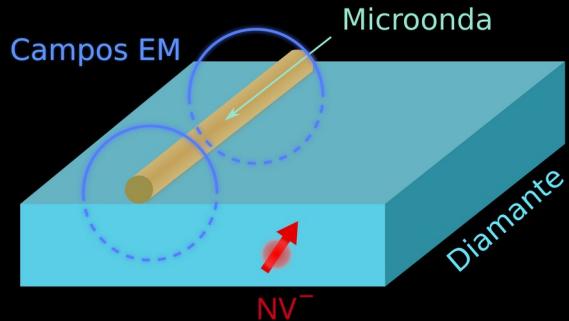
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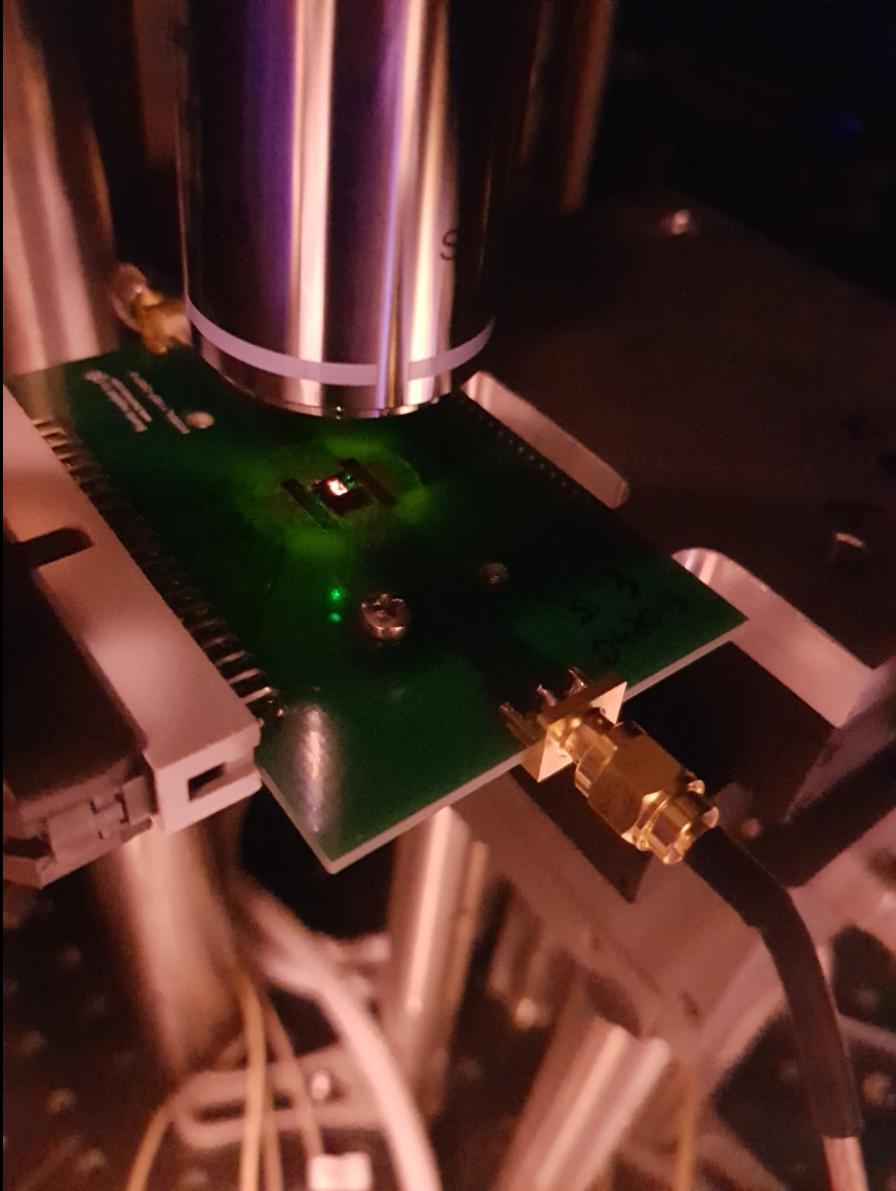
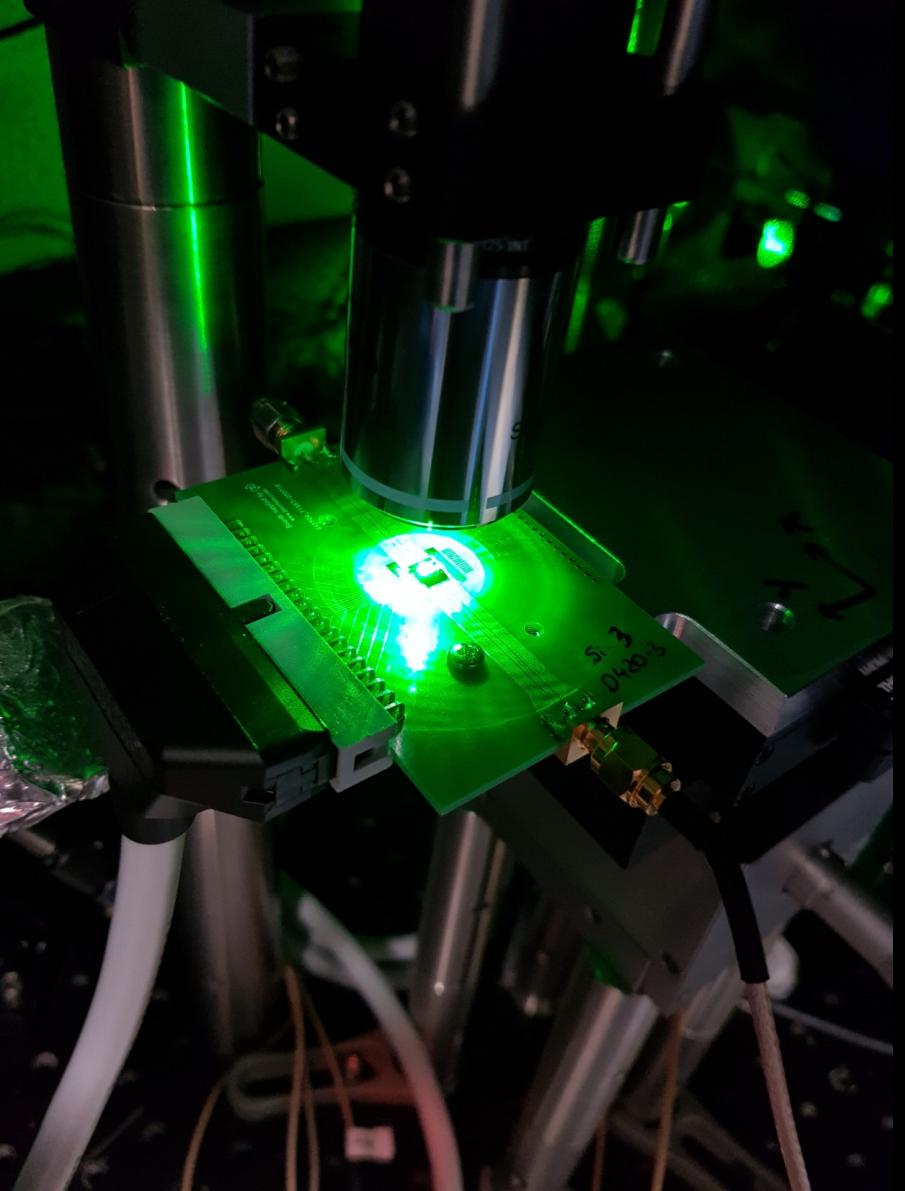


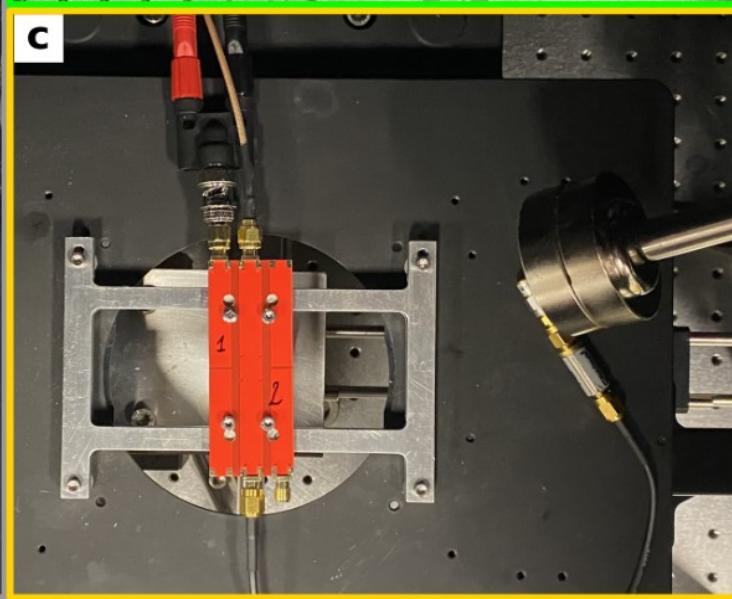
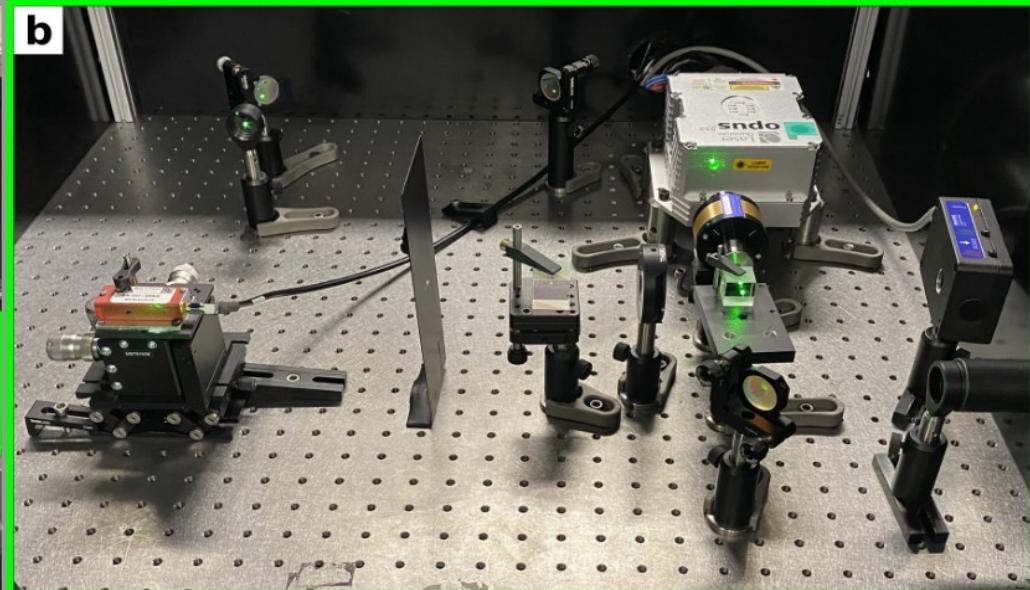
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Niveles cuánticos





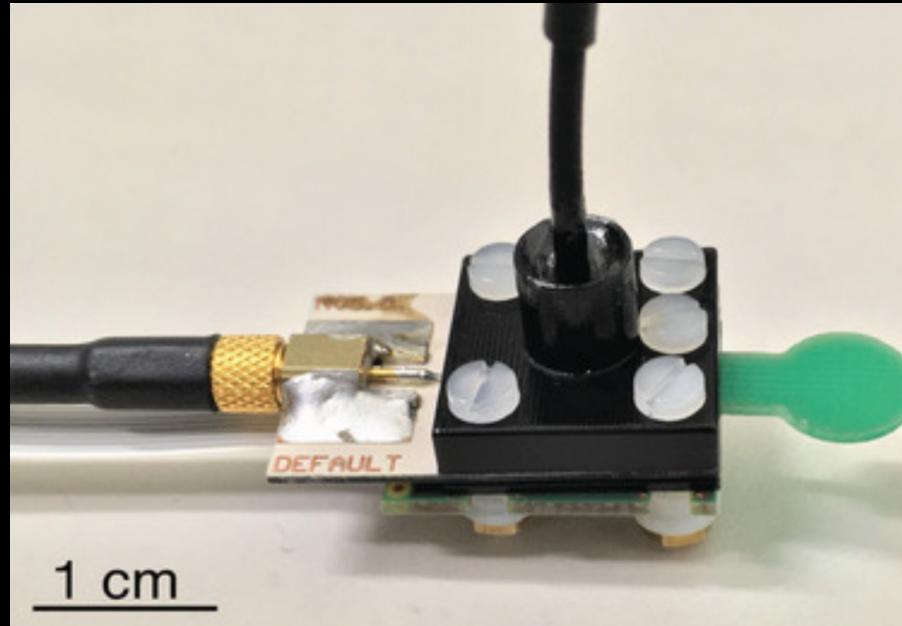


Magnetómetros portables



Artículo: “Integrated and Portable Magnetometer Based on Nitrogen-Vacancy Ensembles in Diamond”

Stürner *et al.* 2021





Navegación

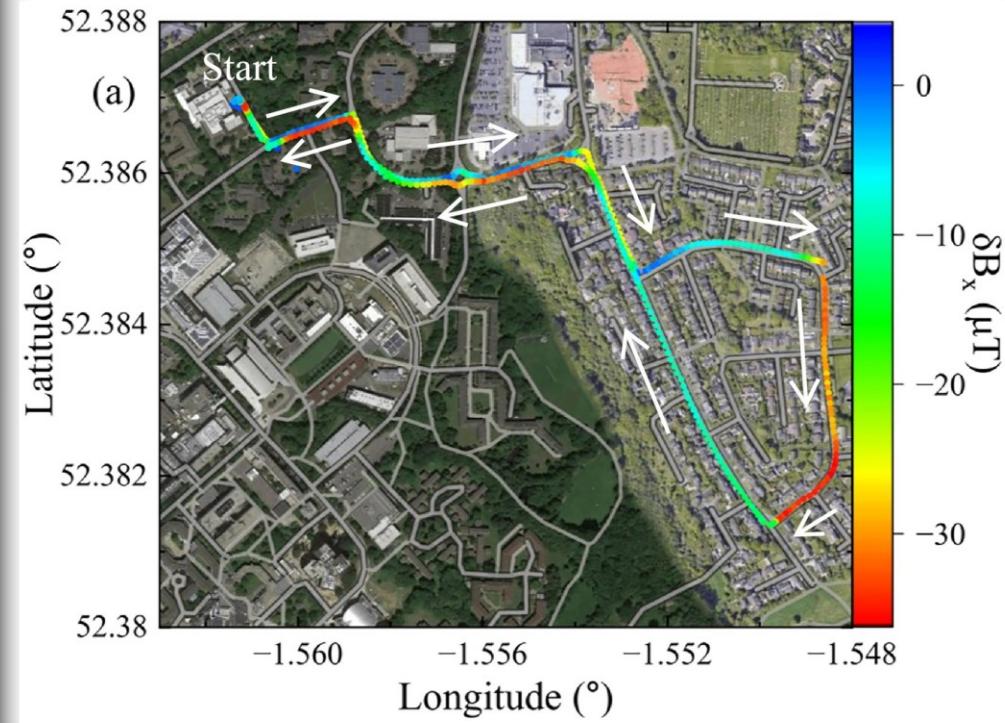


Artículo: "On the road with a diamond magnetometer"

Graham *et al.* 2025



Navegación



Monitoreo

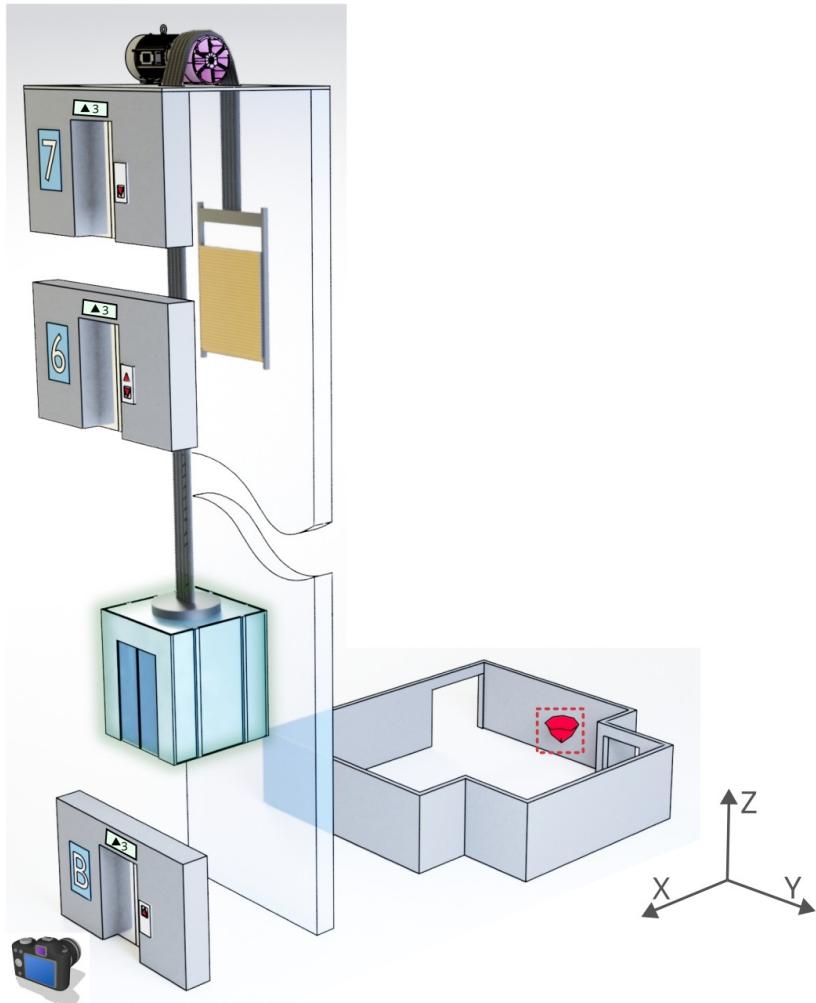


Artículo: “Machine learning assisted tracking of magnetic objects using quantum diamond magnetometry”

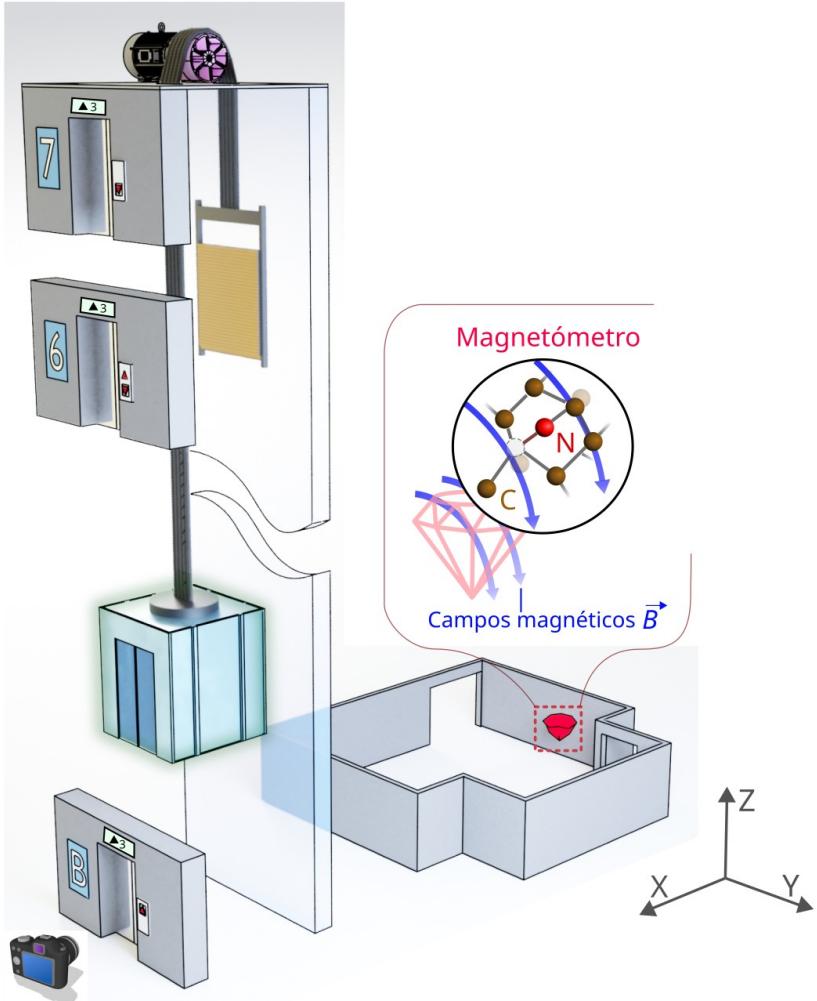
Meneses *et al.* 2025



Monitoreo

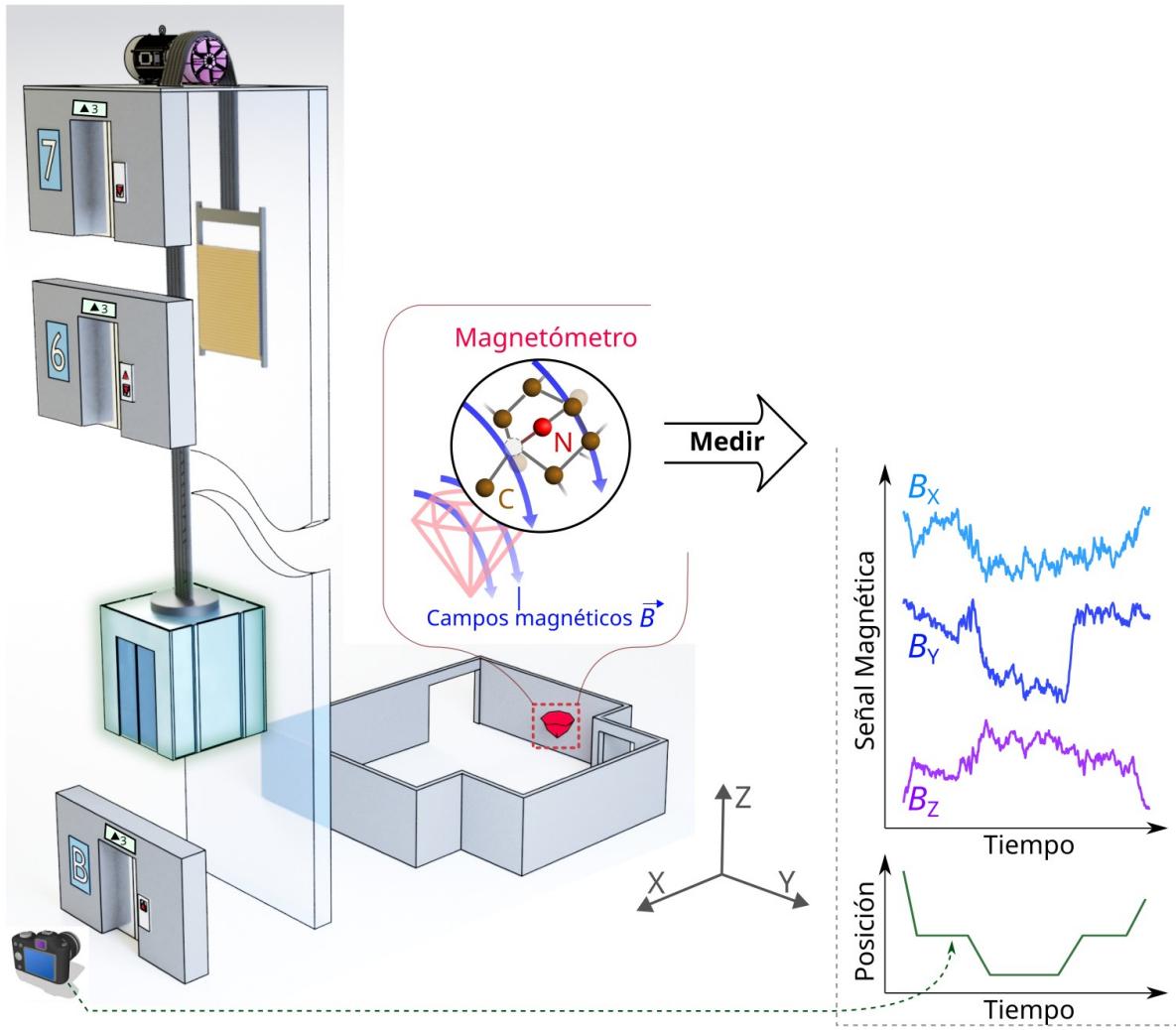


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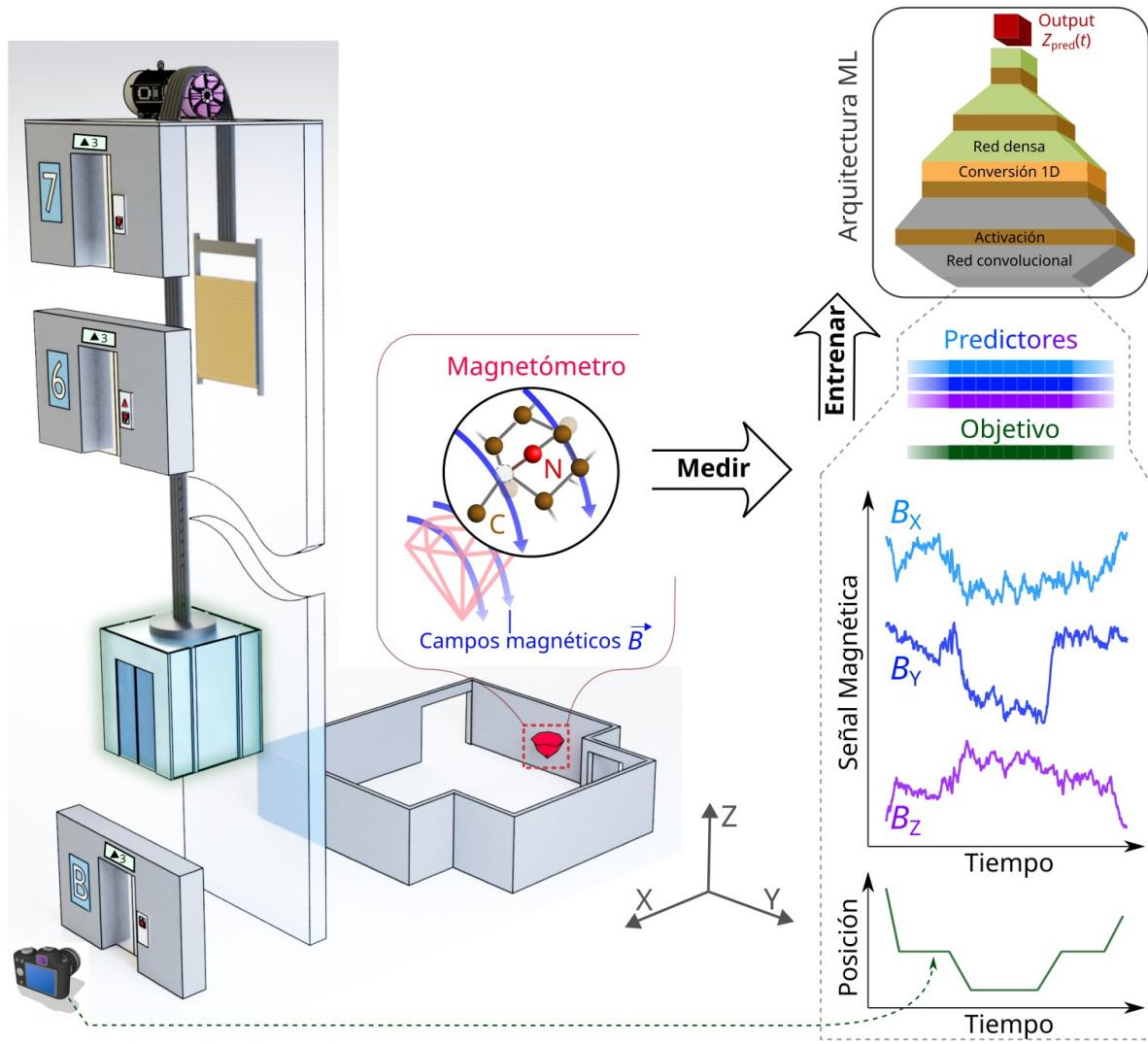


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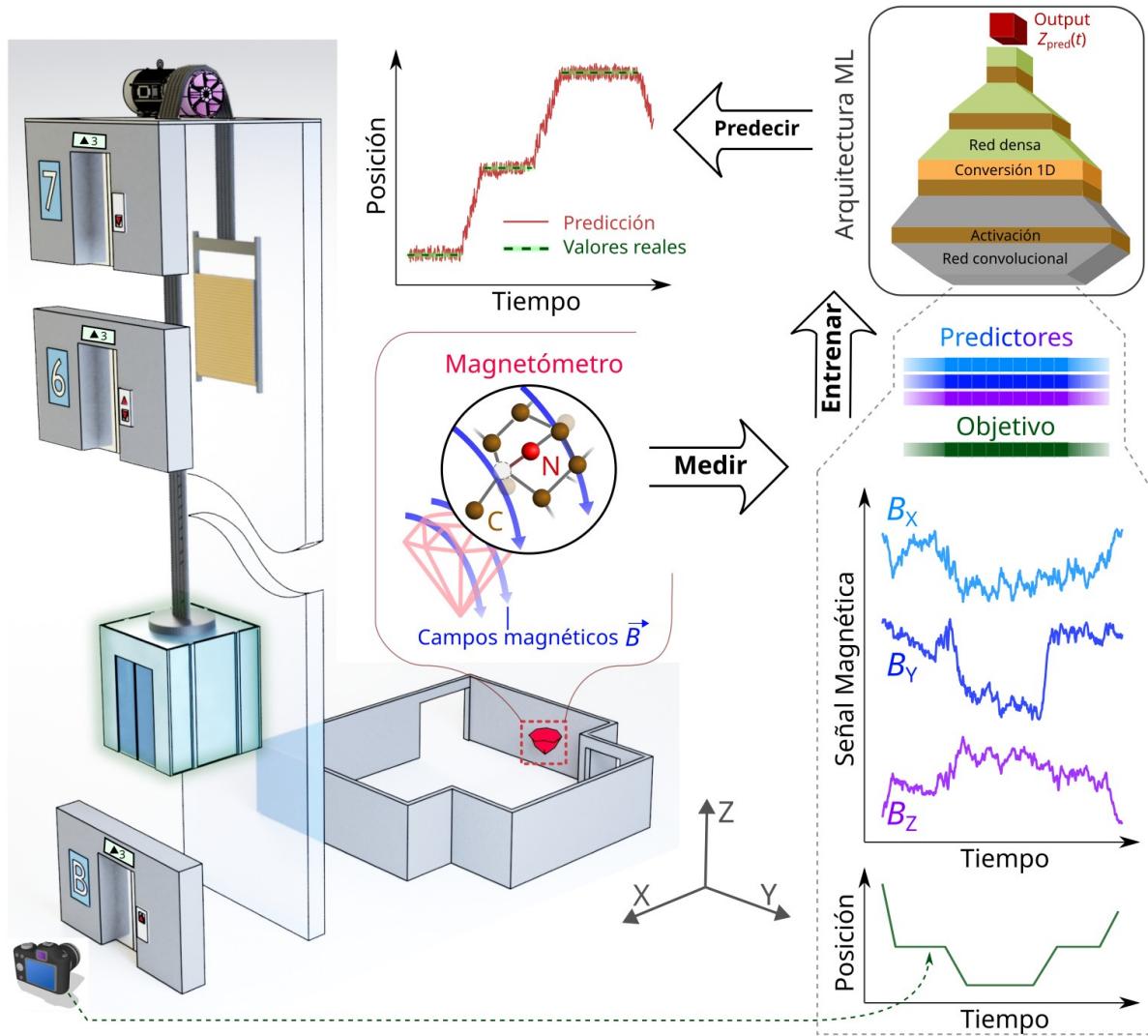
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Monitoreo



Monitoreo



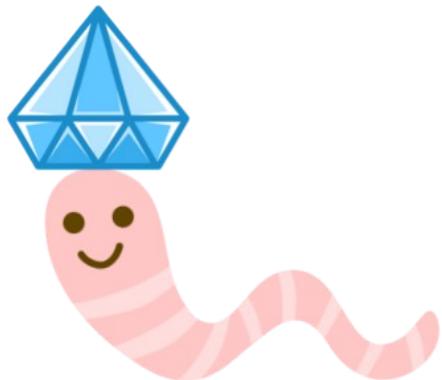


Actividad Neuronal



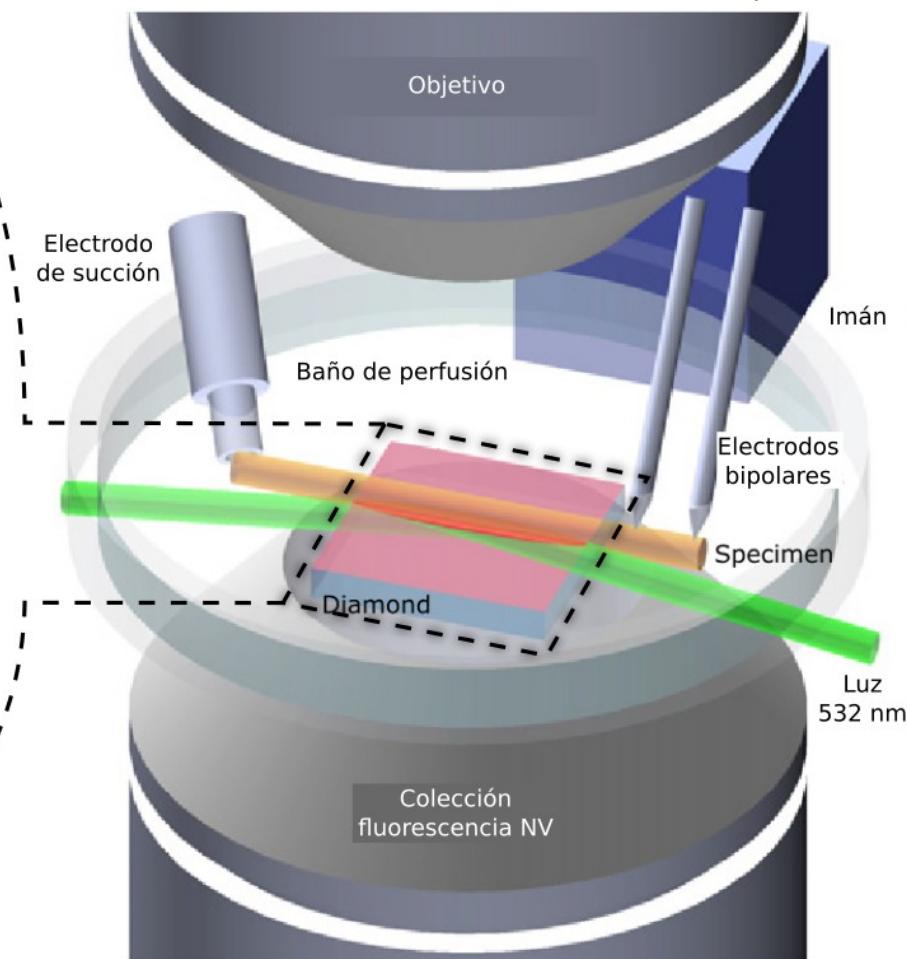
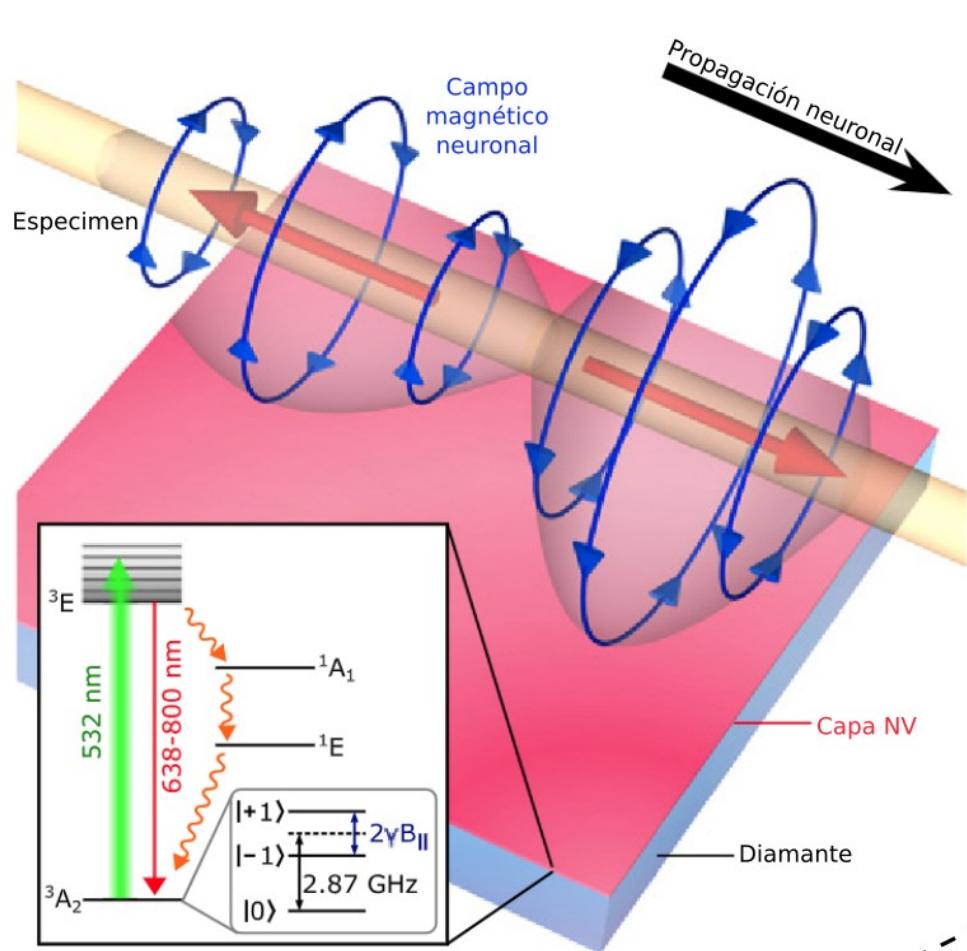
Artículo: “Optical magnetic detection of single-neuron action potentials using quantum defects in diamond”

Barry *et al.* 2016

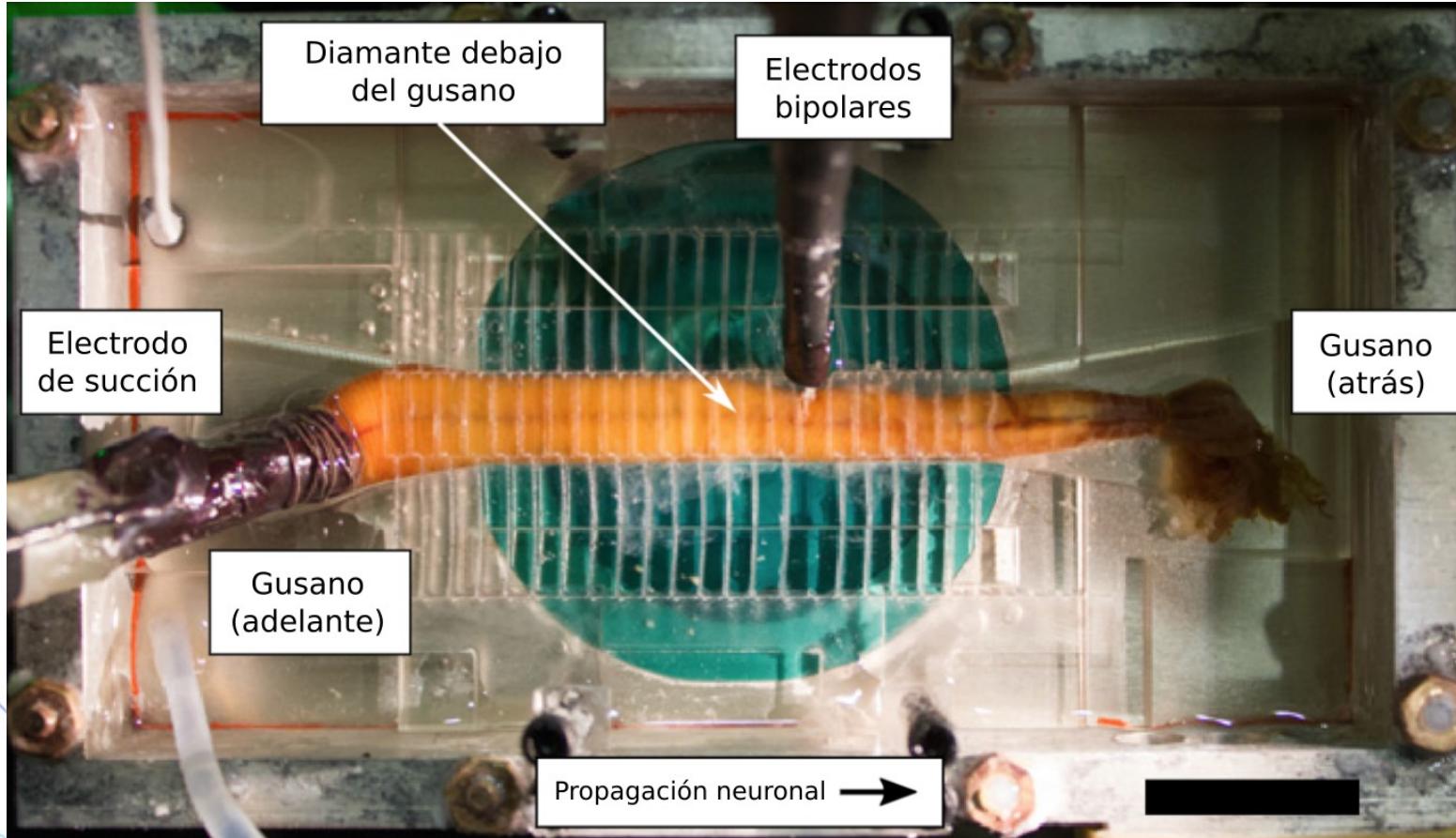


Actividad Neuronal

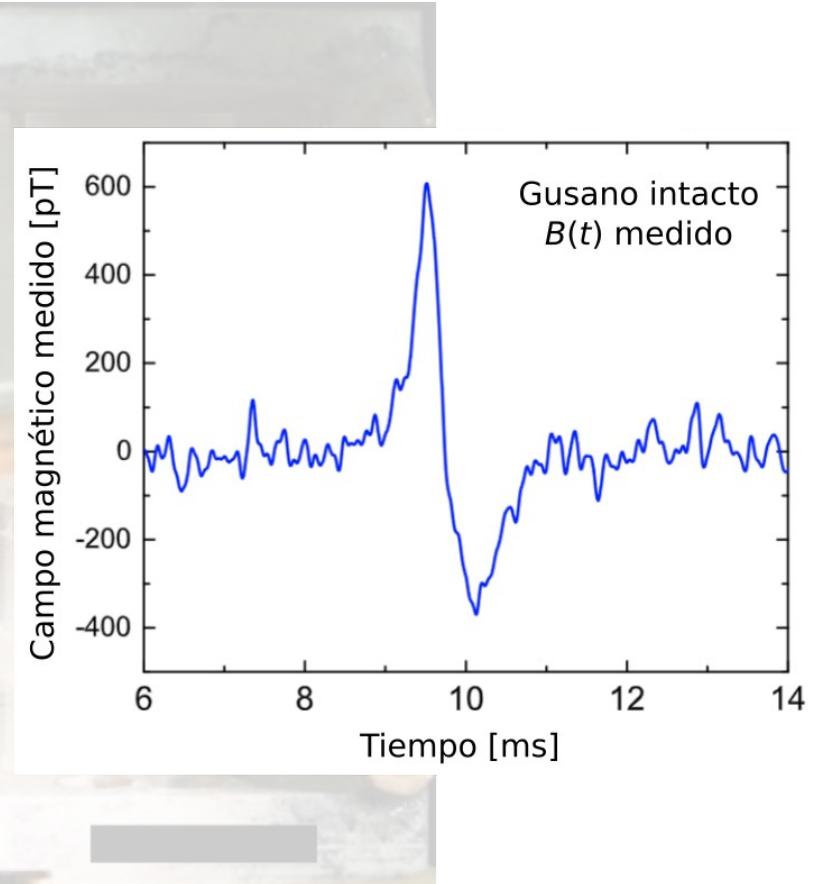
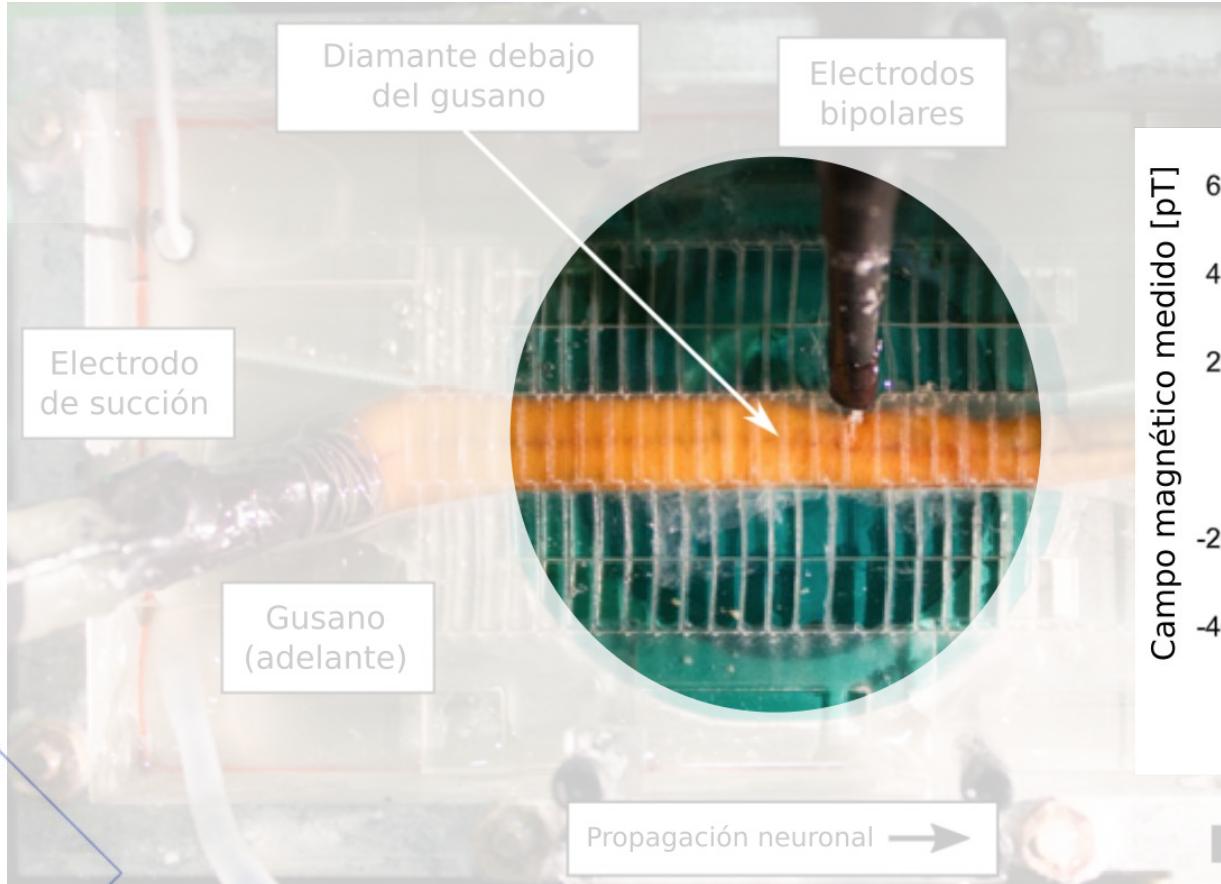
Barry et al. 2016



Actividad Neuronal



Actividad Neuronal



Mapa de Actividad Neuronal



Artículo: "Neuronal growth on high-aspect-ratio diamond nanopillar arrays for biosensing applications"

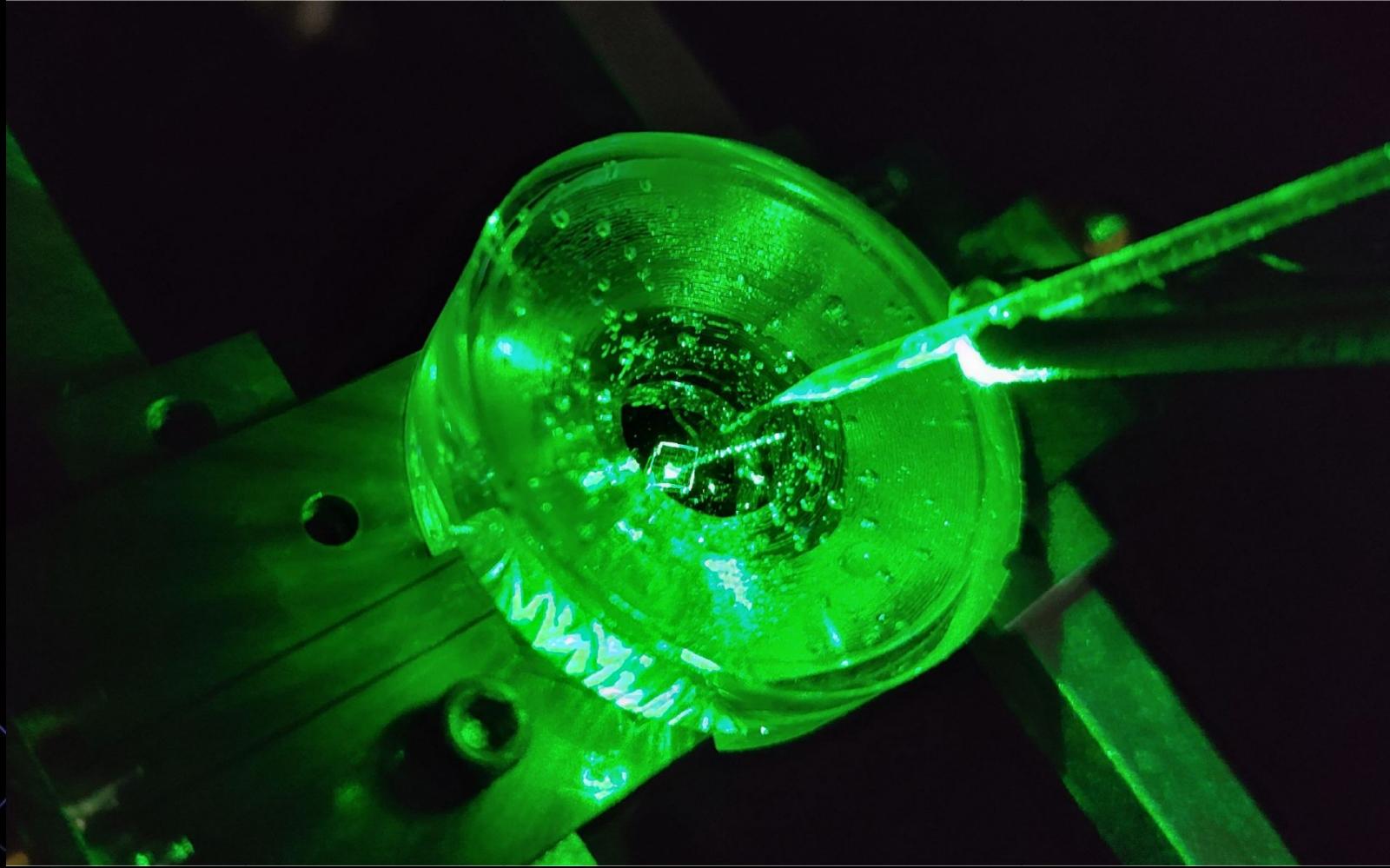
Losero et al. 2023



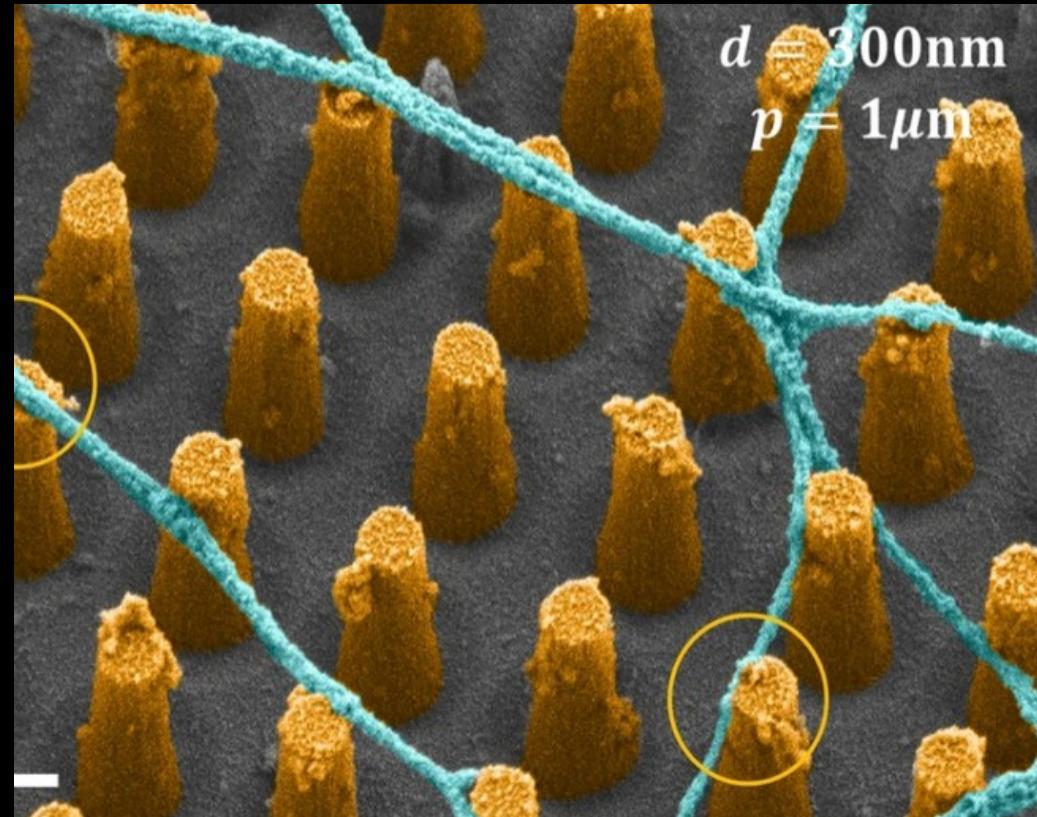
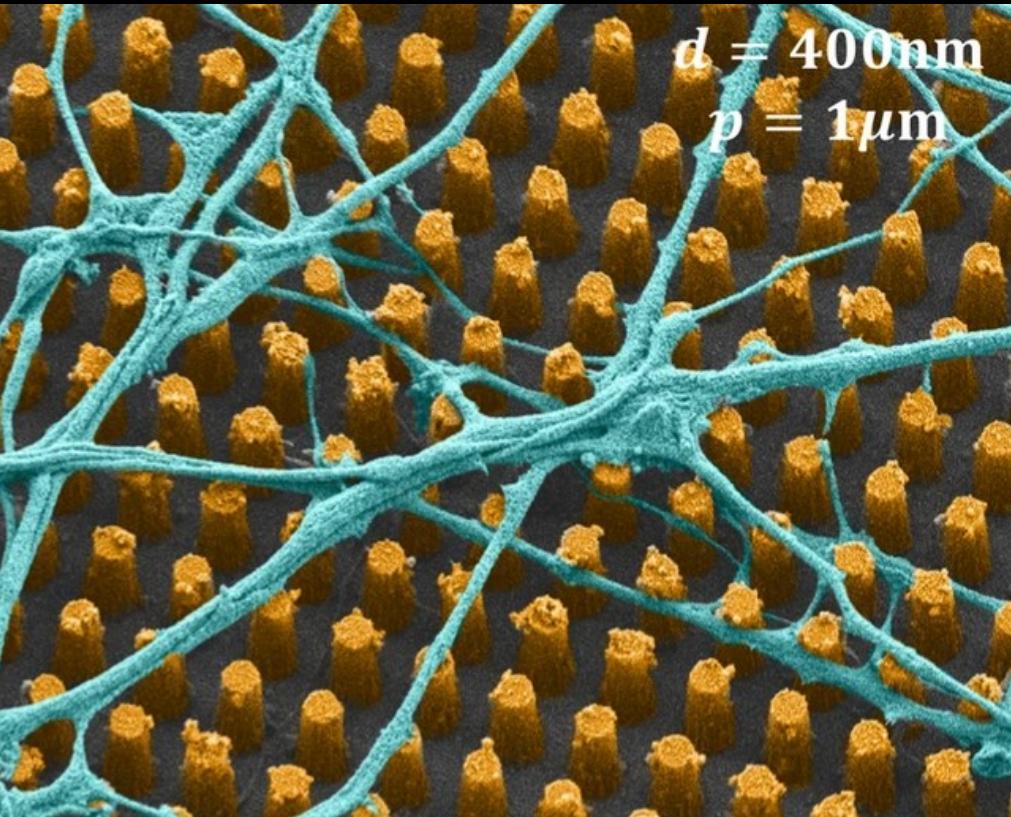
Artículo: "A diamond voltage imaging microscope"

McCloskey et al. 2022

Mapa de Actividad Neuronal



Mapa de Actividad Neuronal



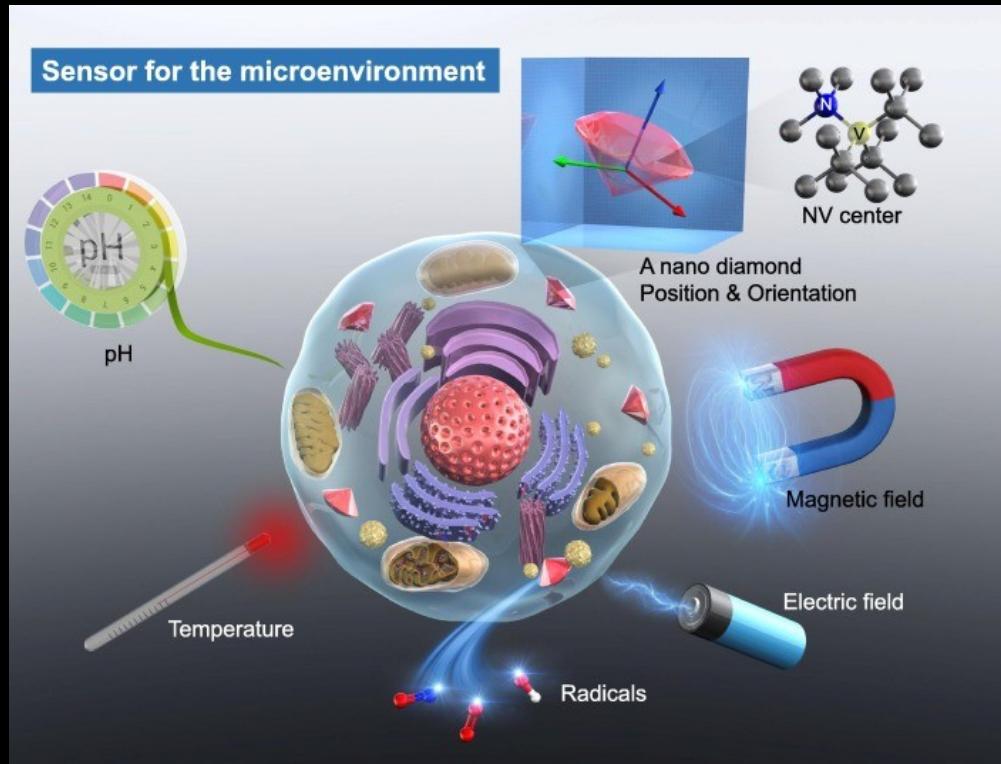


Biosensores



Artículo: “Nanoscale quantum sensing with Nitrogen-Vacancy centers in nanodiamonds – A magnetic resonance perspective”

Segawa & Igarashi 2023



Nanodiamantes como biosensores



Nanodiamantes para diagnóstico

>2.000 millones de personas tienen desórdenes de hierro.

1 de cada 5 mujeres tienen deficiencia de hierro.

Nanodiamantes para diagnóstico

FeBI Technologies

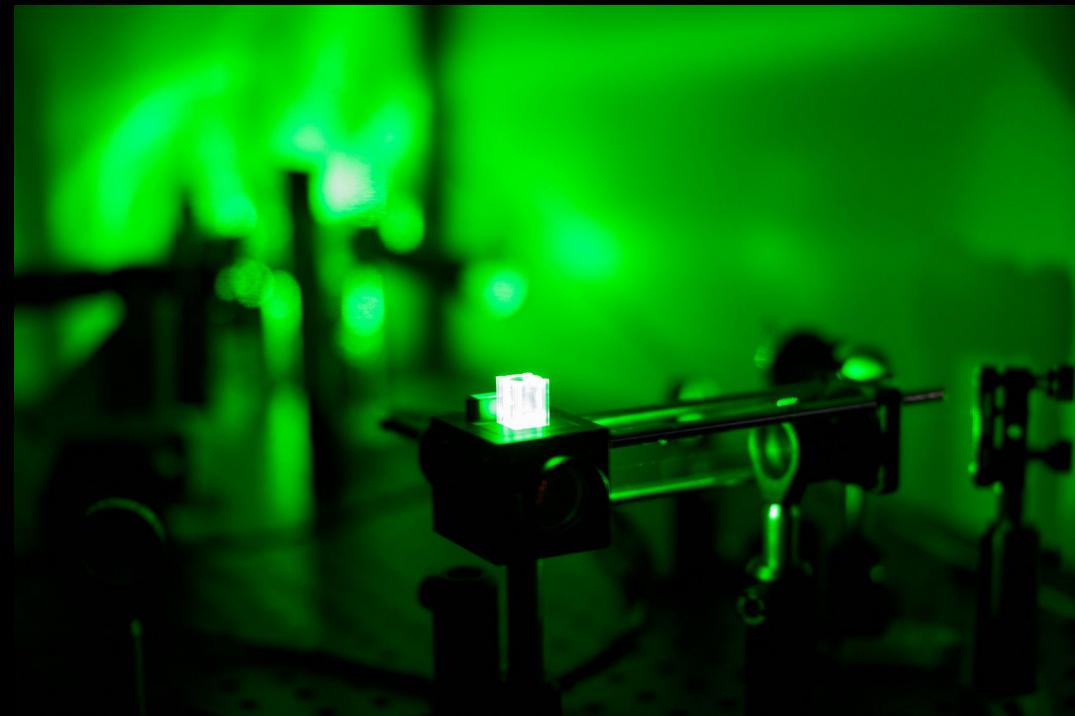
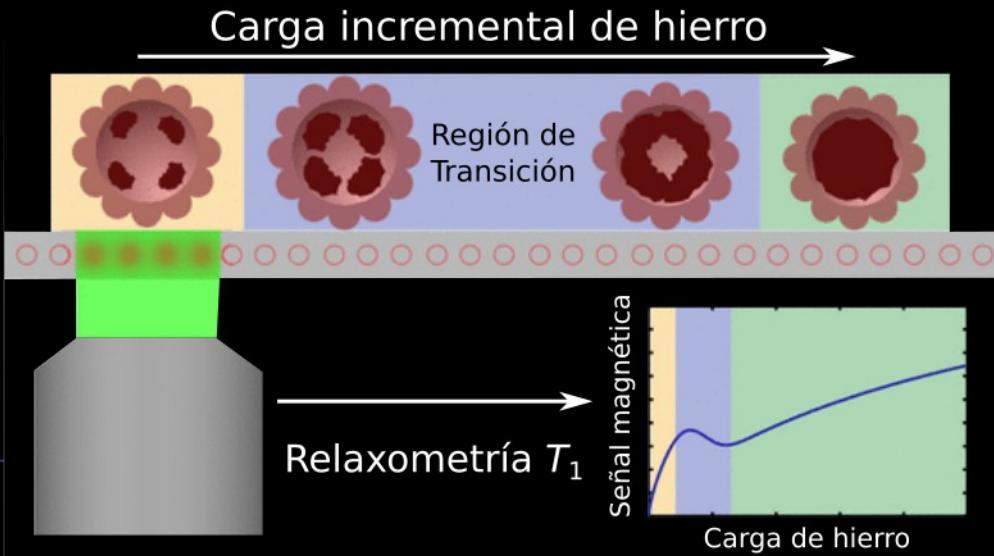
Tecnología cuántica para
diagnósticos precisos

Nanodiamantes para diagnóstico



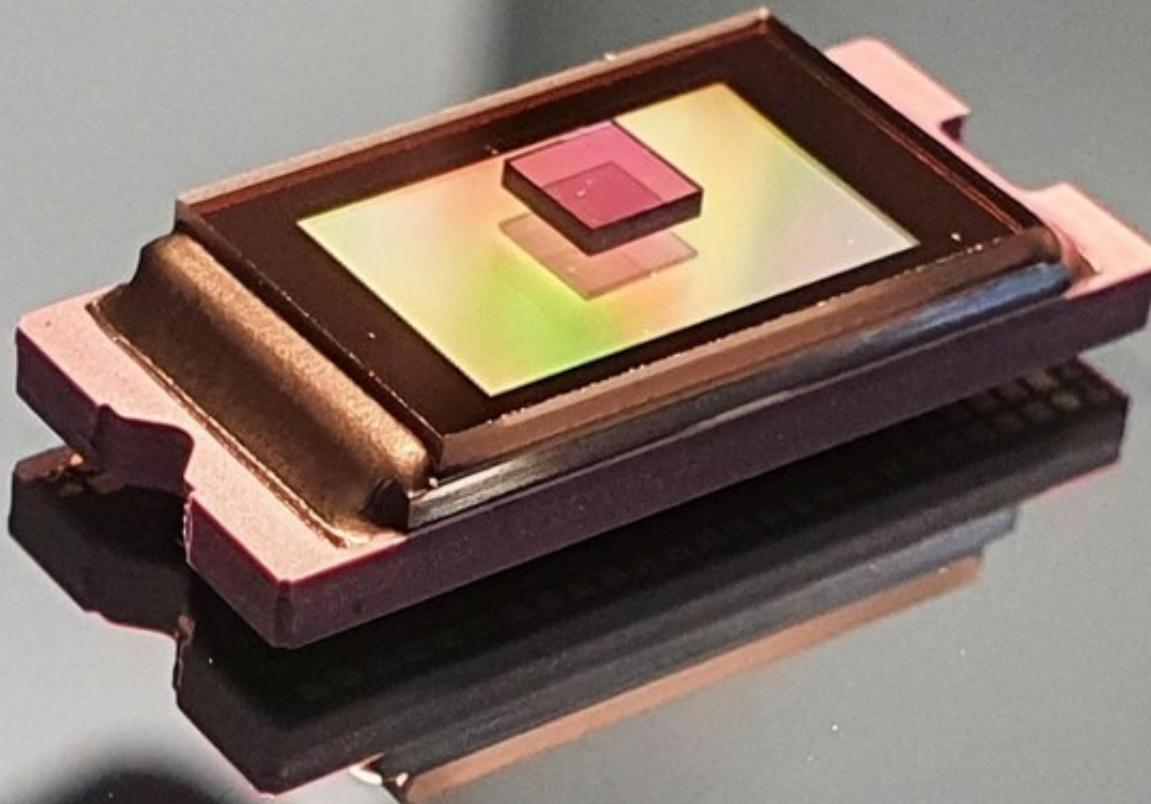
Artículo: "Nonmonotonic Superparamagnetic Behavior of the Ferritin Iron Core Revealed via Quantum Spin Relaxometry"

Grant *et al.* 2022

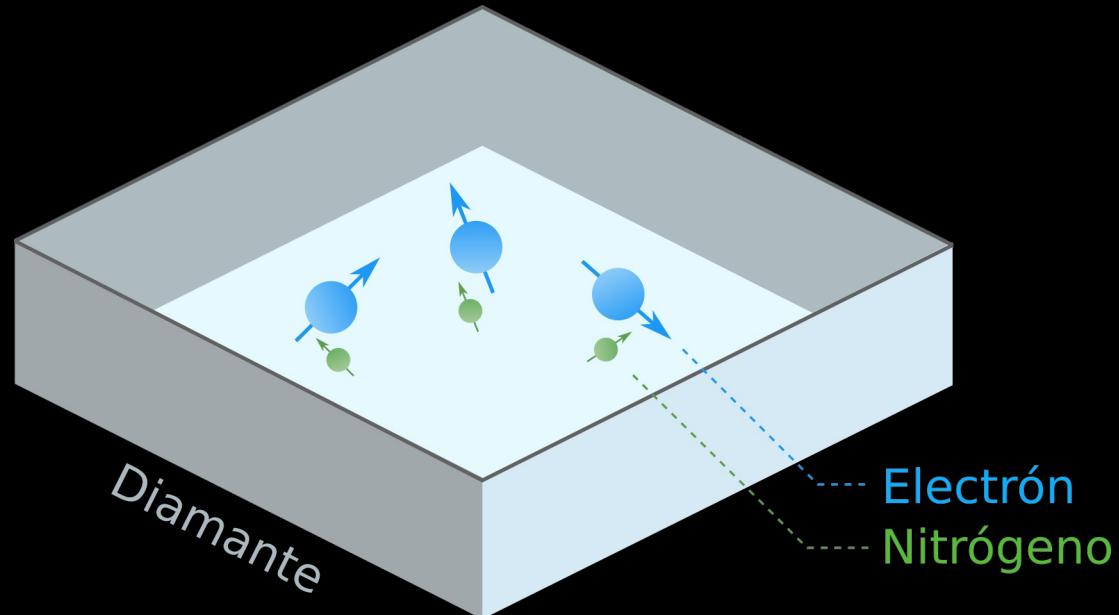




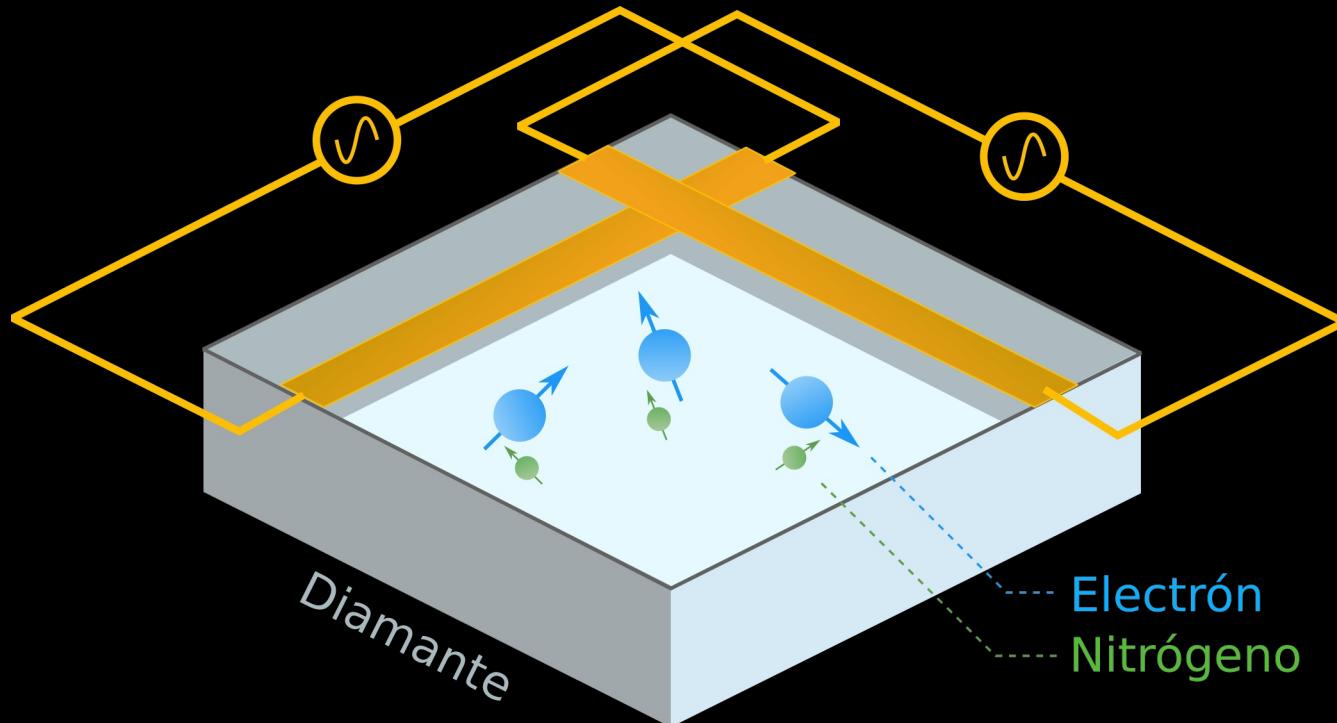
Computación cuántica



Memoria cuántica

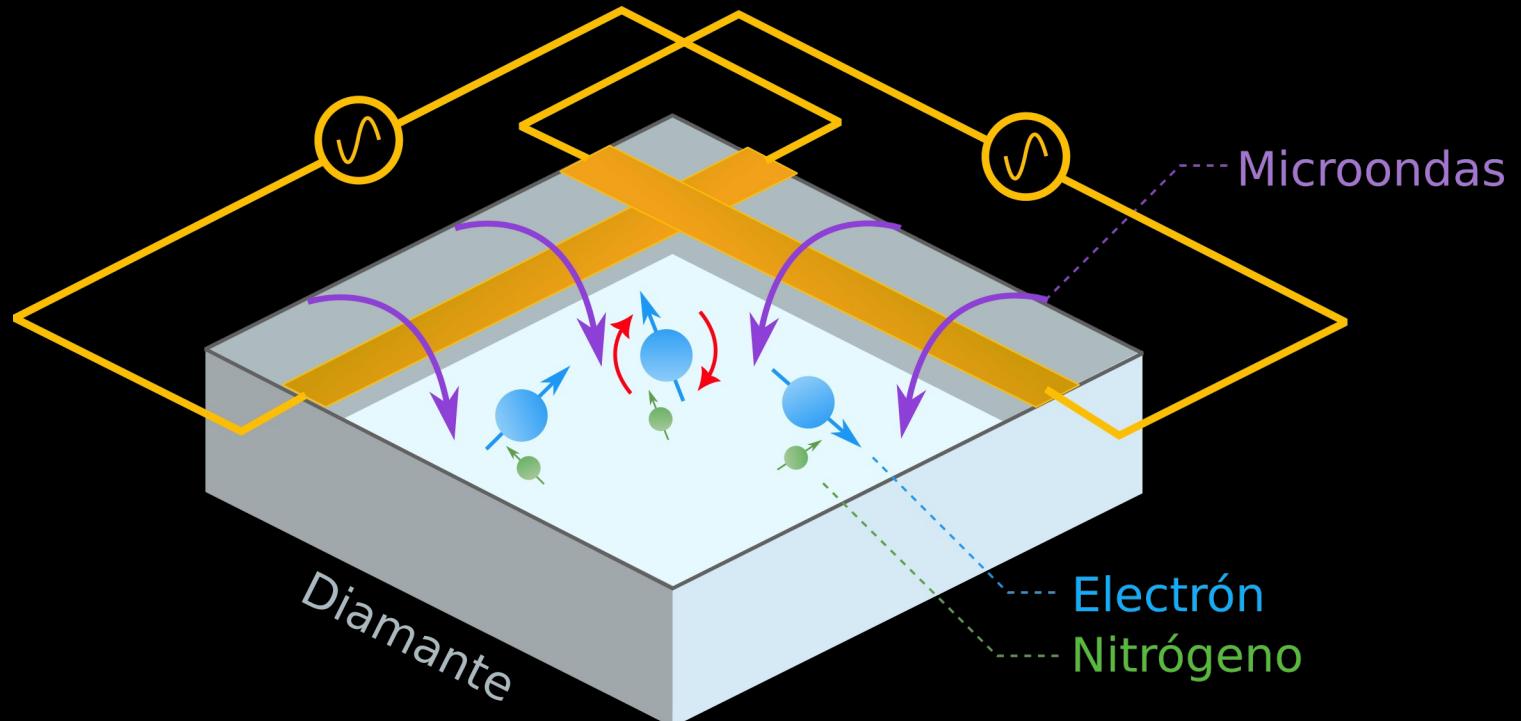


Memoria cuántica

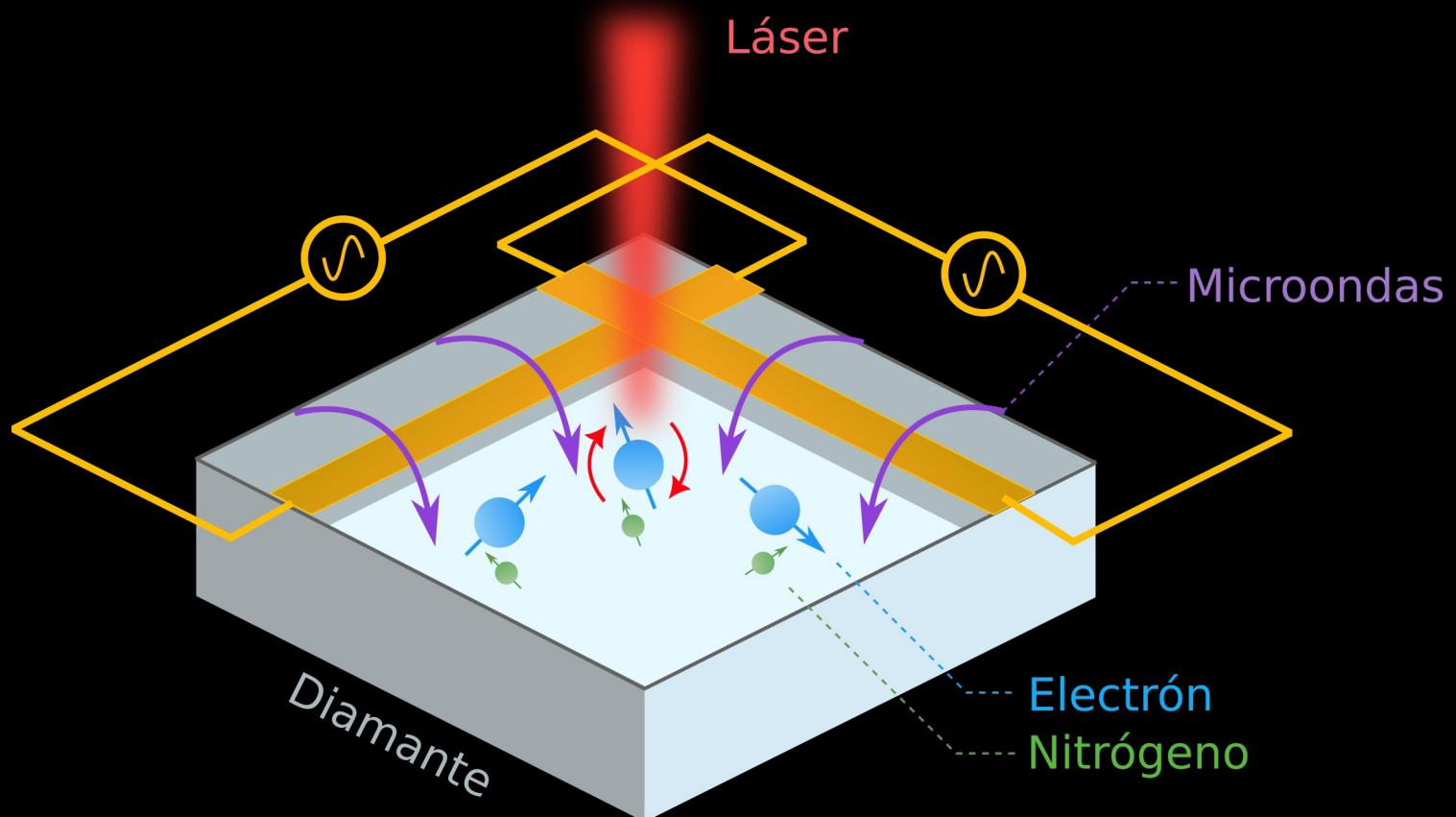


Electrón
Nitrógeno

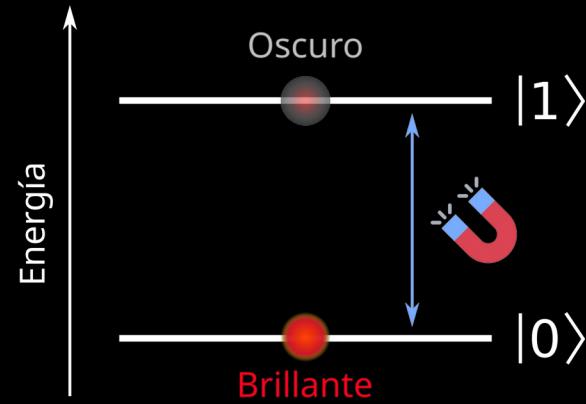
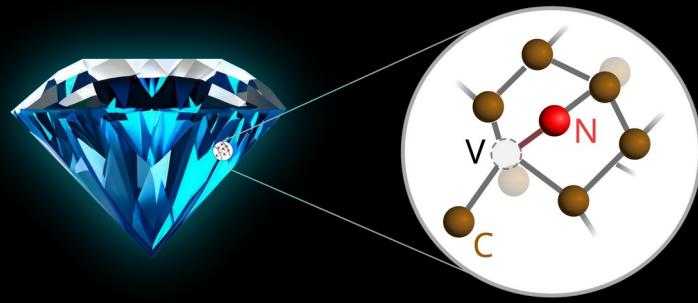
Memoria cuántica



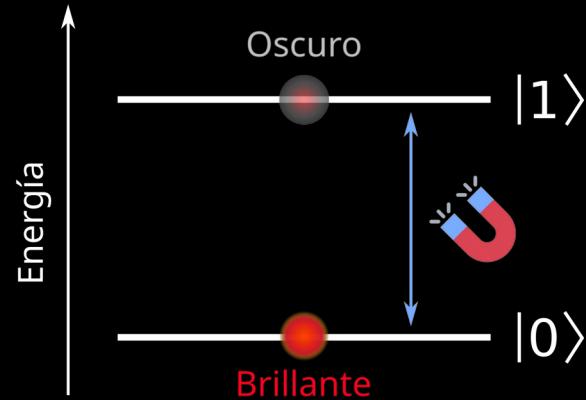
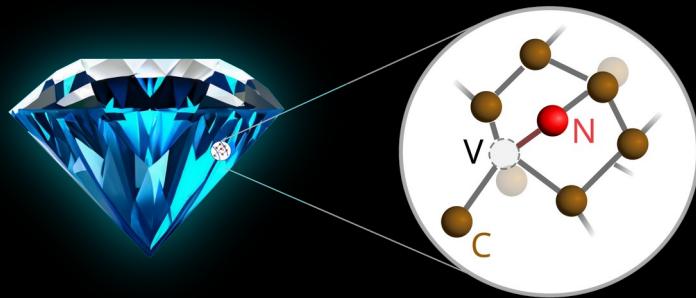
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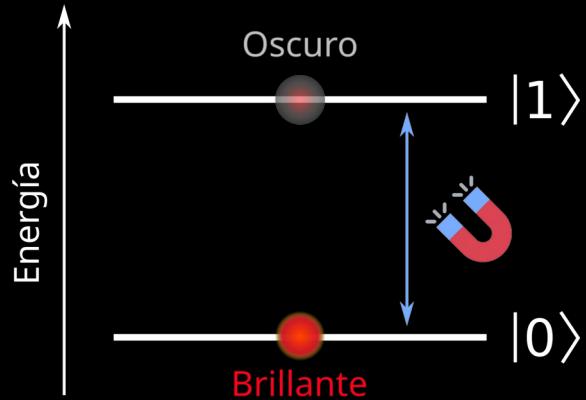
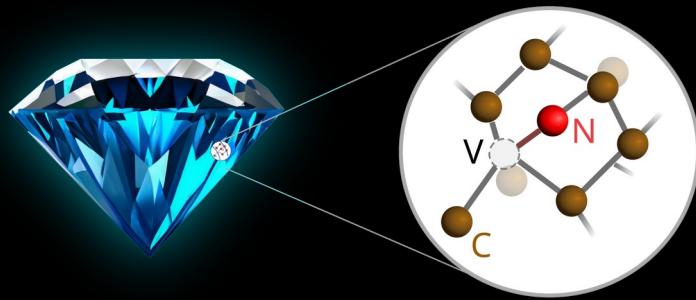
Resumen



Resumen



¡Gracias! ¿Preguntas?



Web/Contacto

