

# Diamantes para Sensado Cuántico

FAMAF



RRAFTA 2025

Fernando  
Meneses

# Esquema



Breve teoría



Dispositivos experimentales

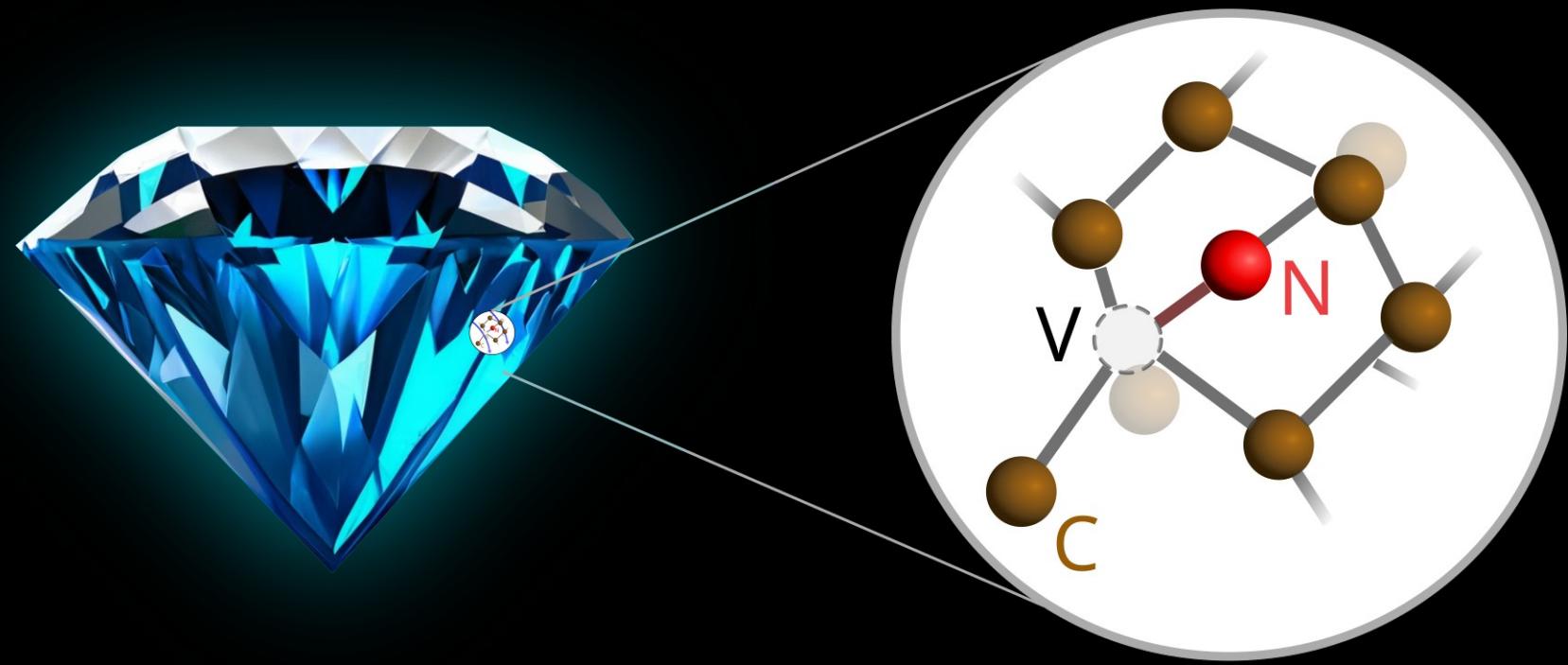


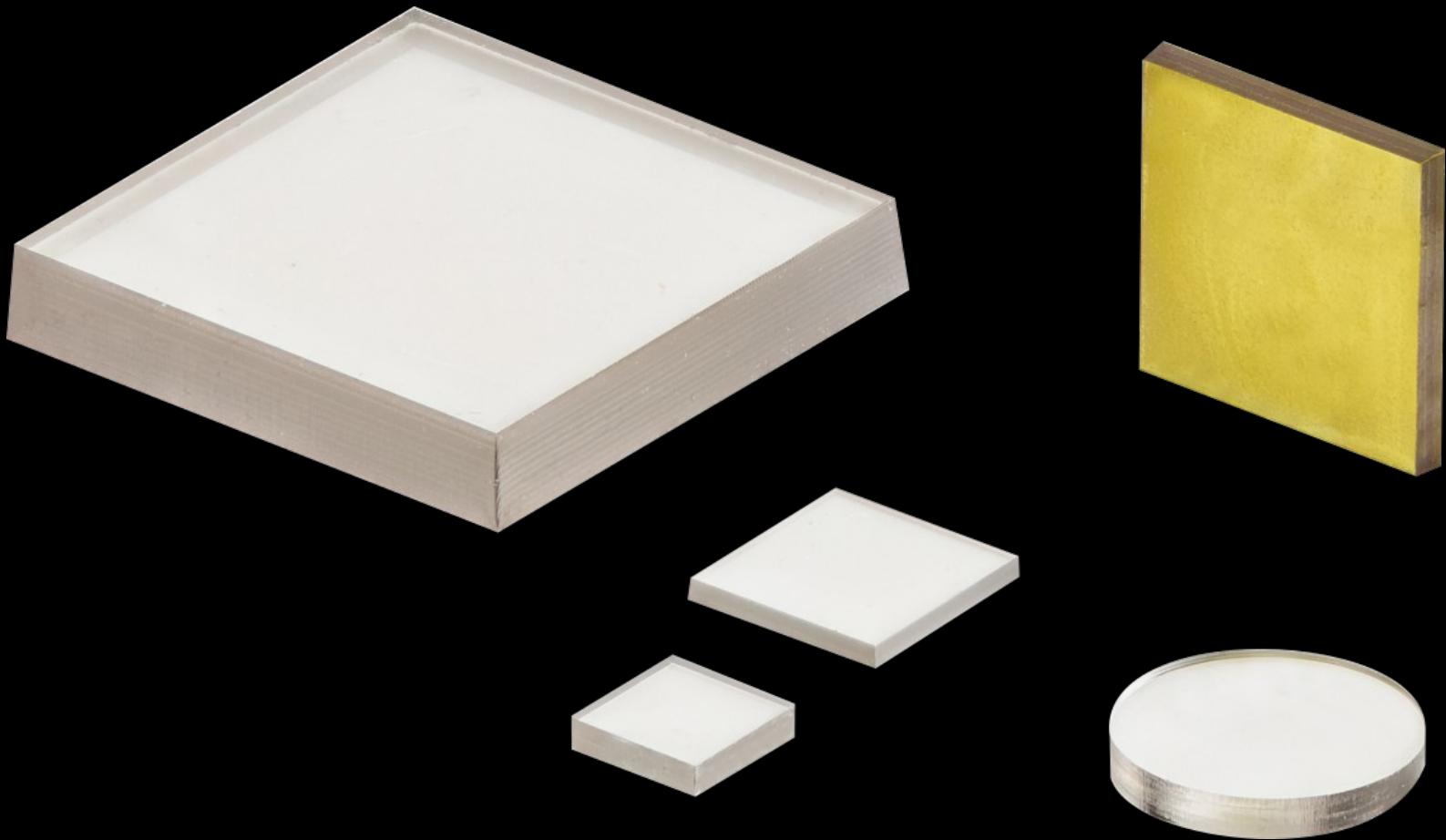
Aplicaciones



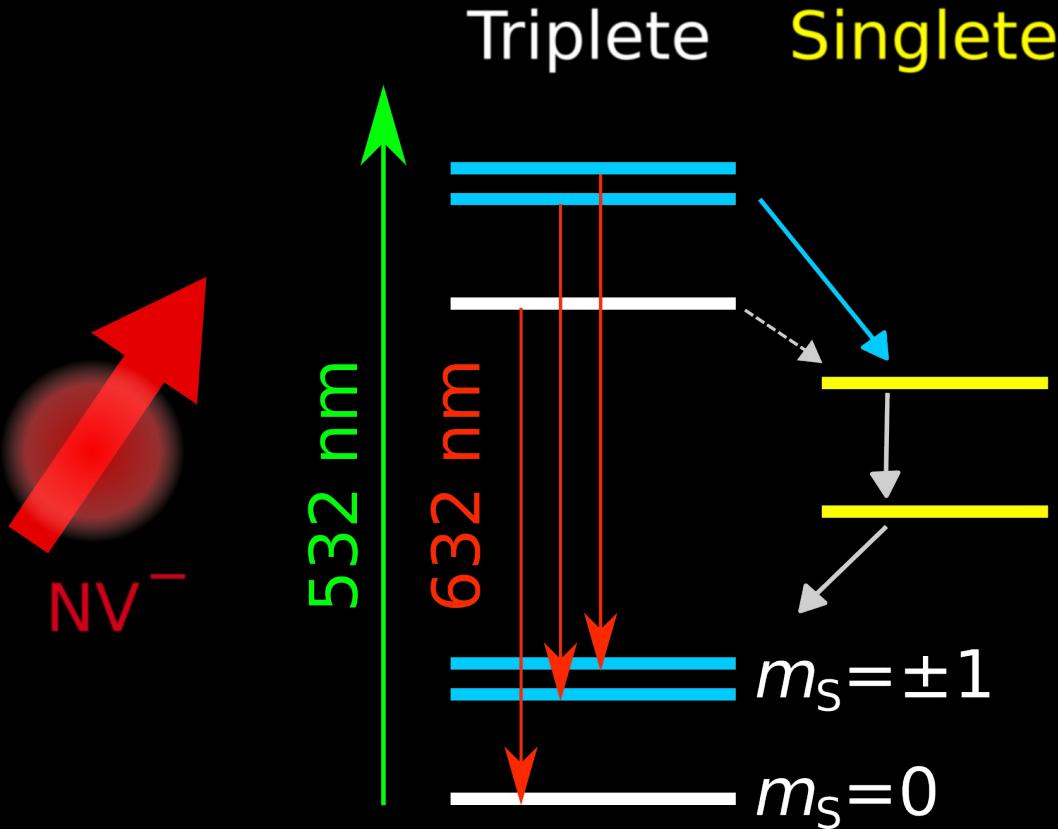
Resumen

# El diamante y los defectos NV



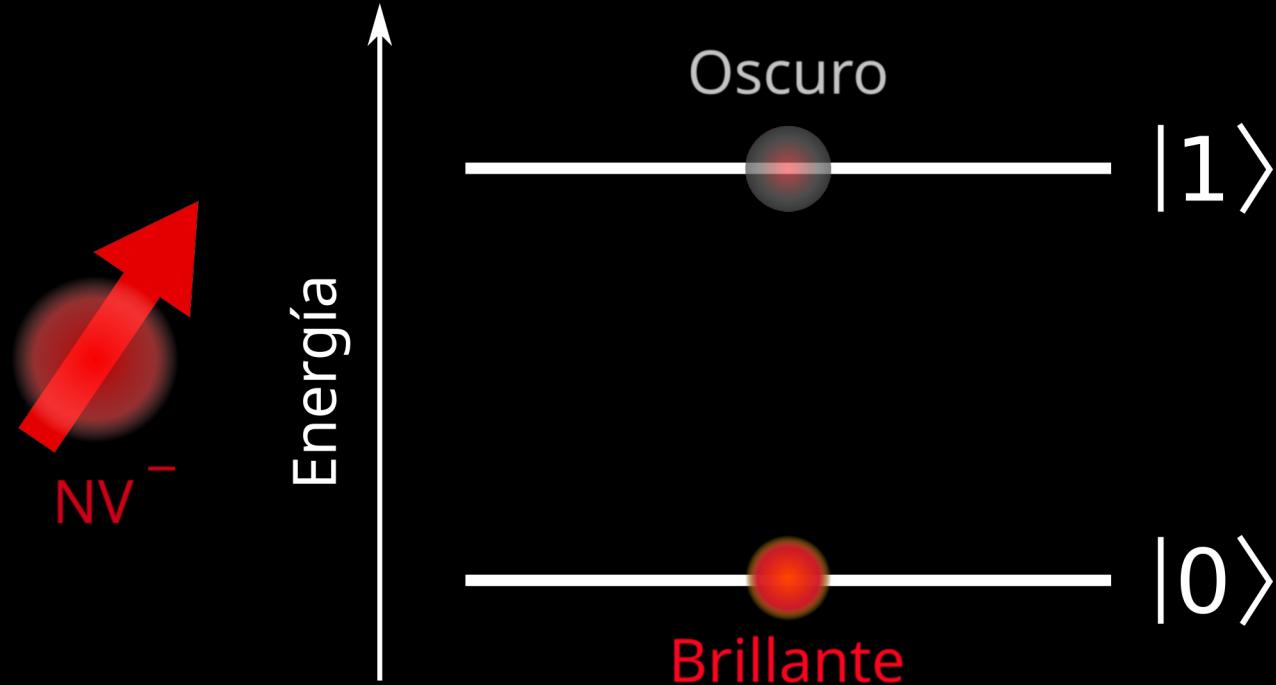


# Niveles cuánticos

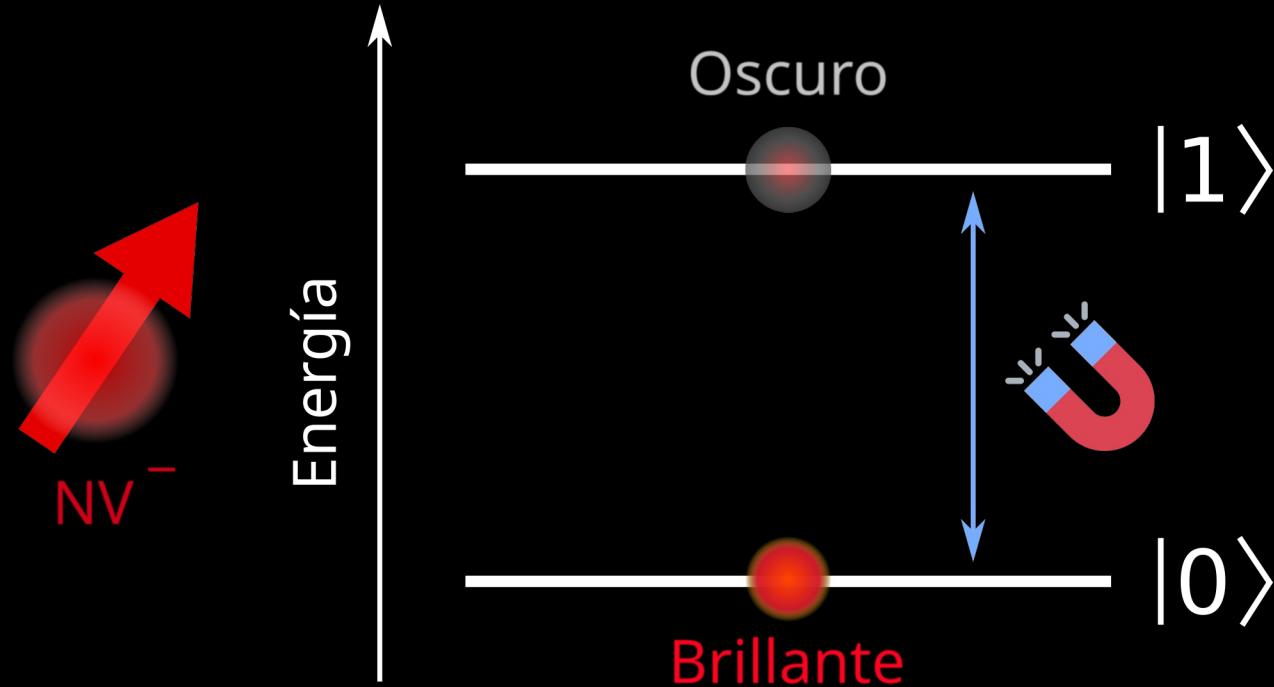




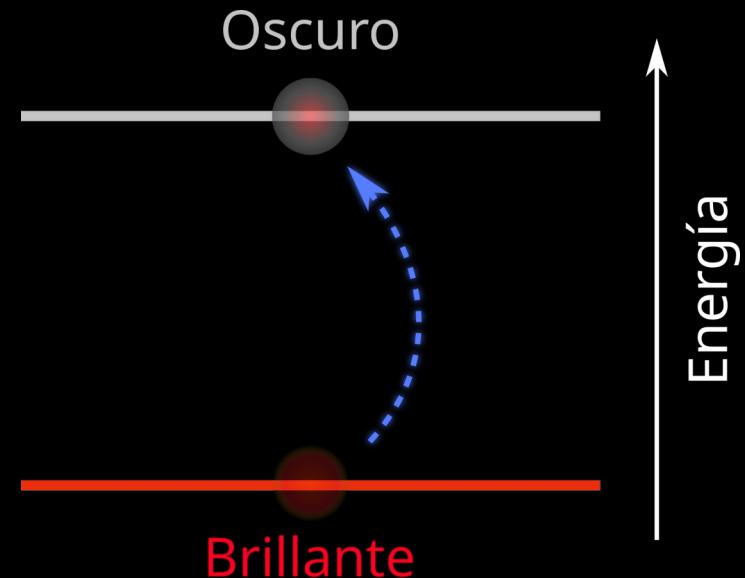
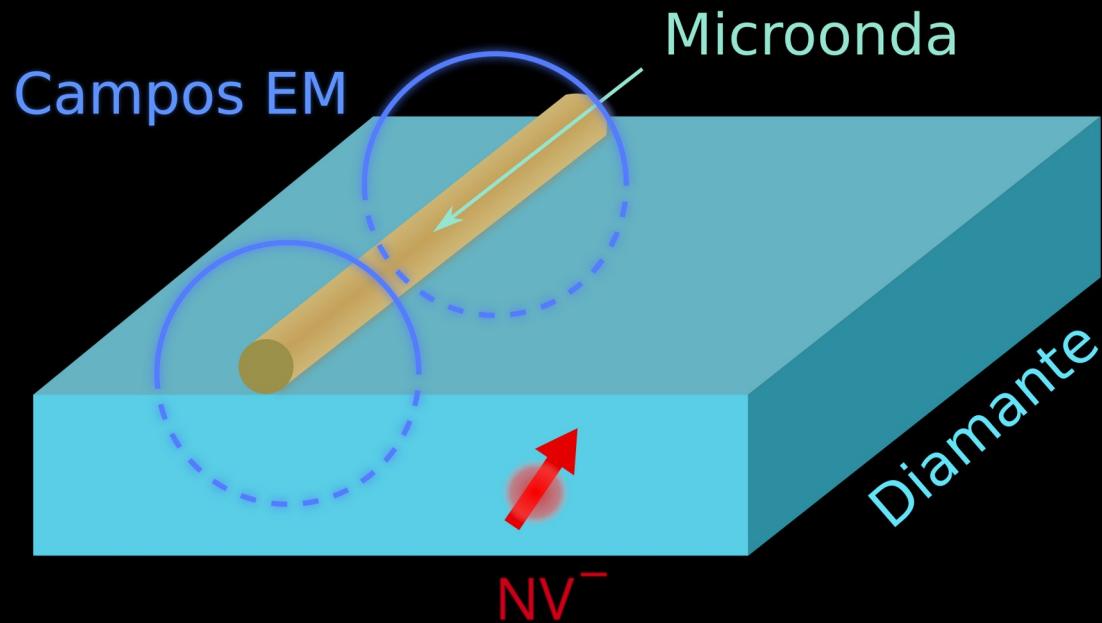
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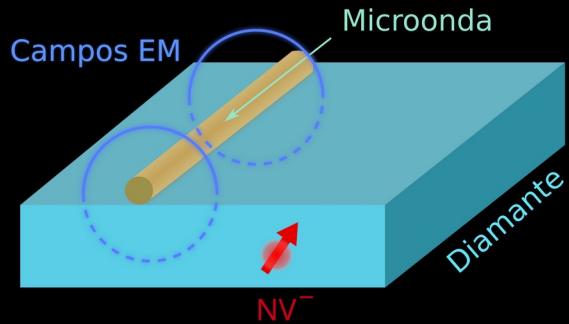
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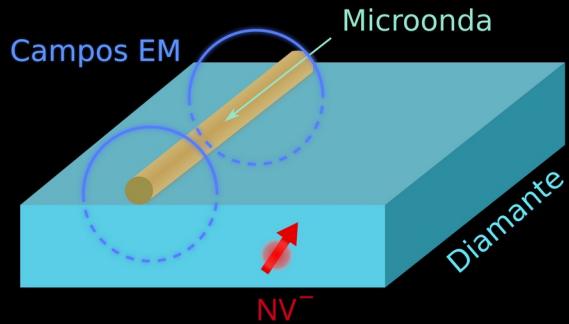
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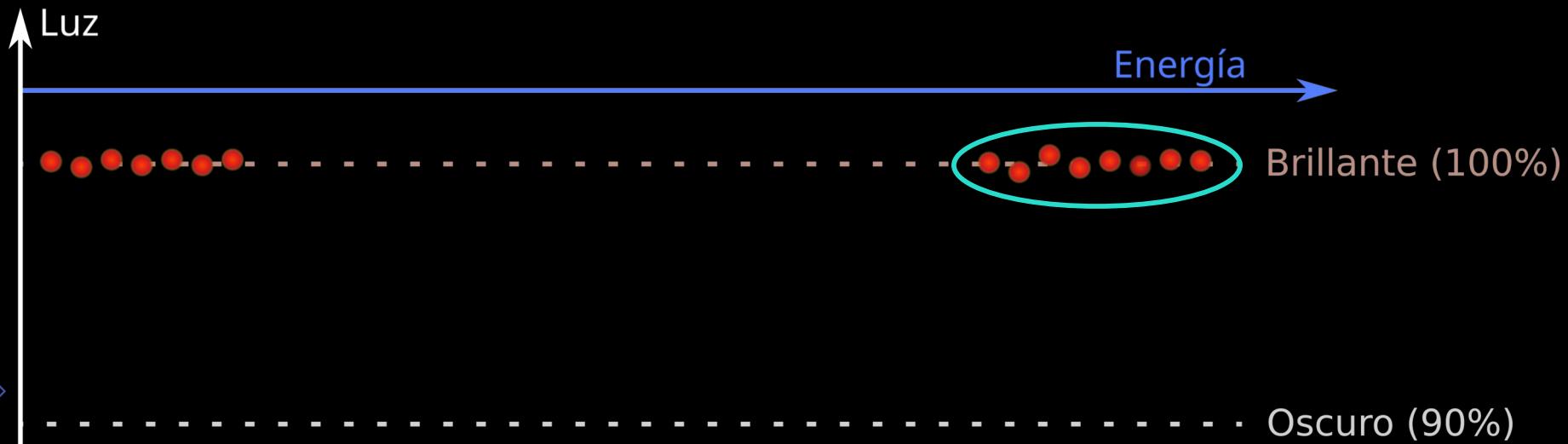
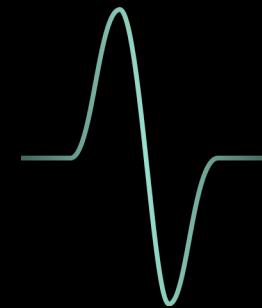
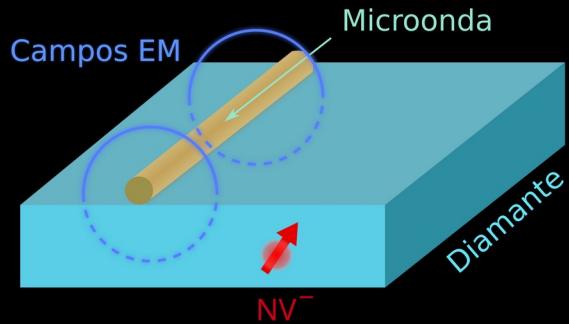
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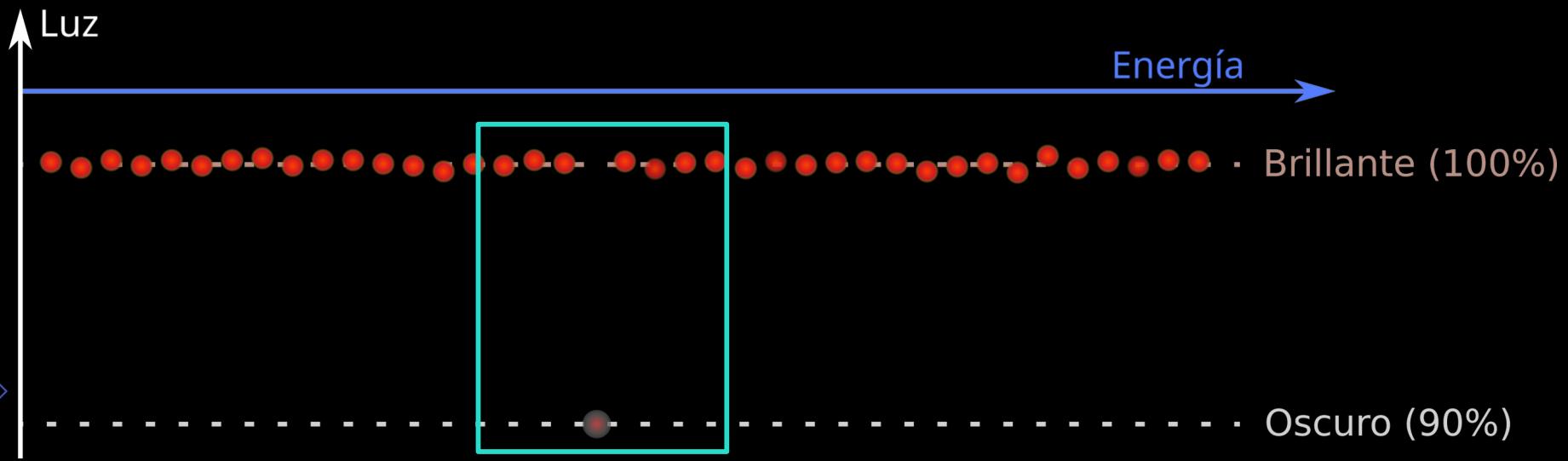
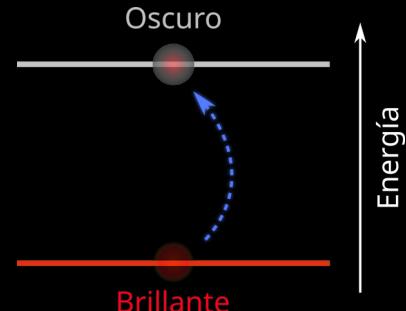
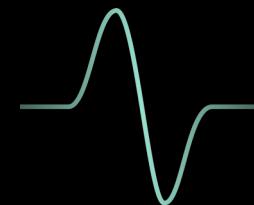
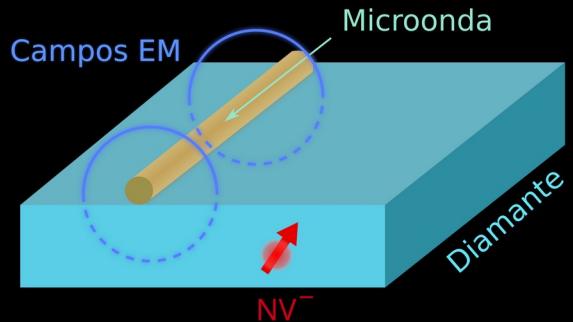
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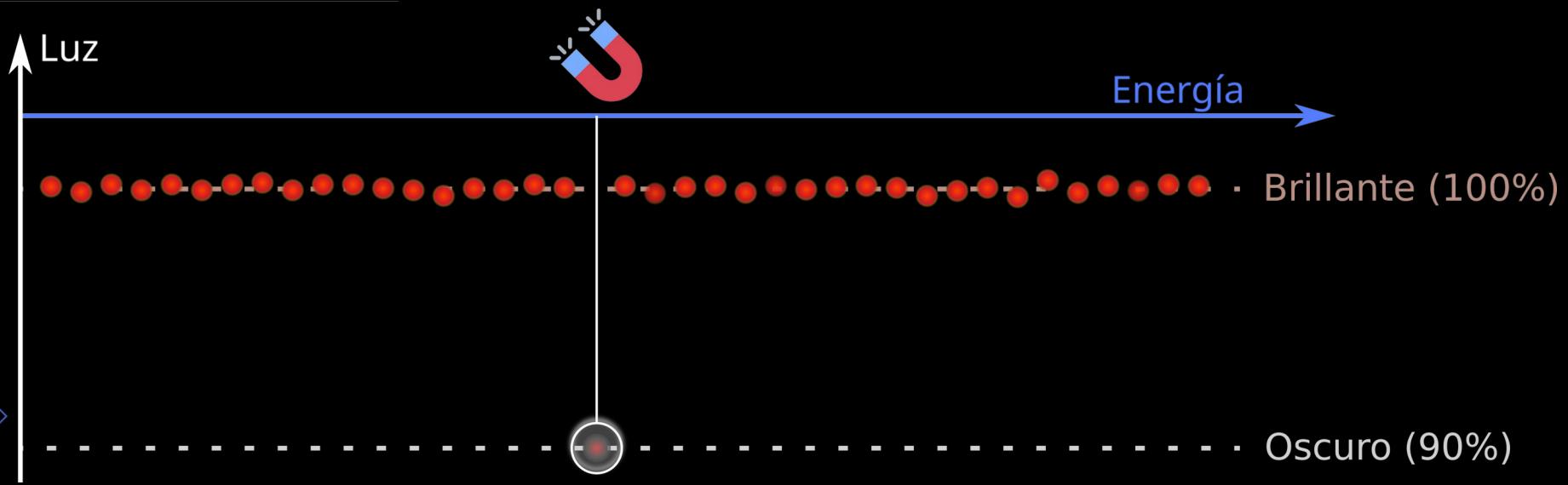
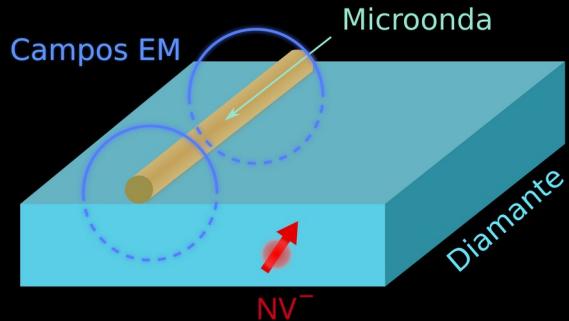
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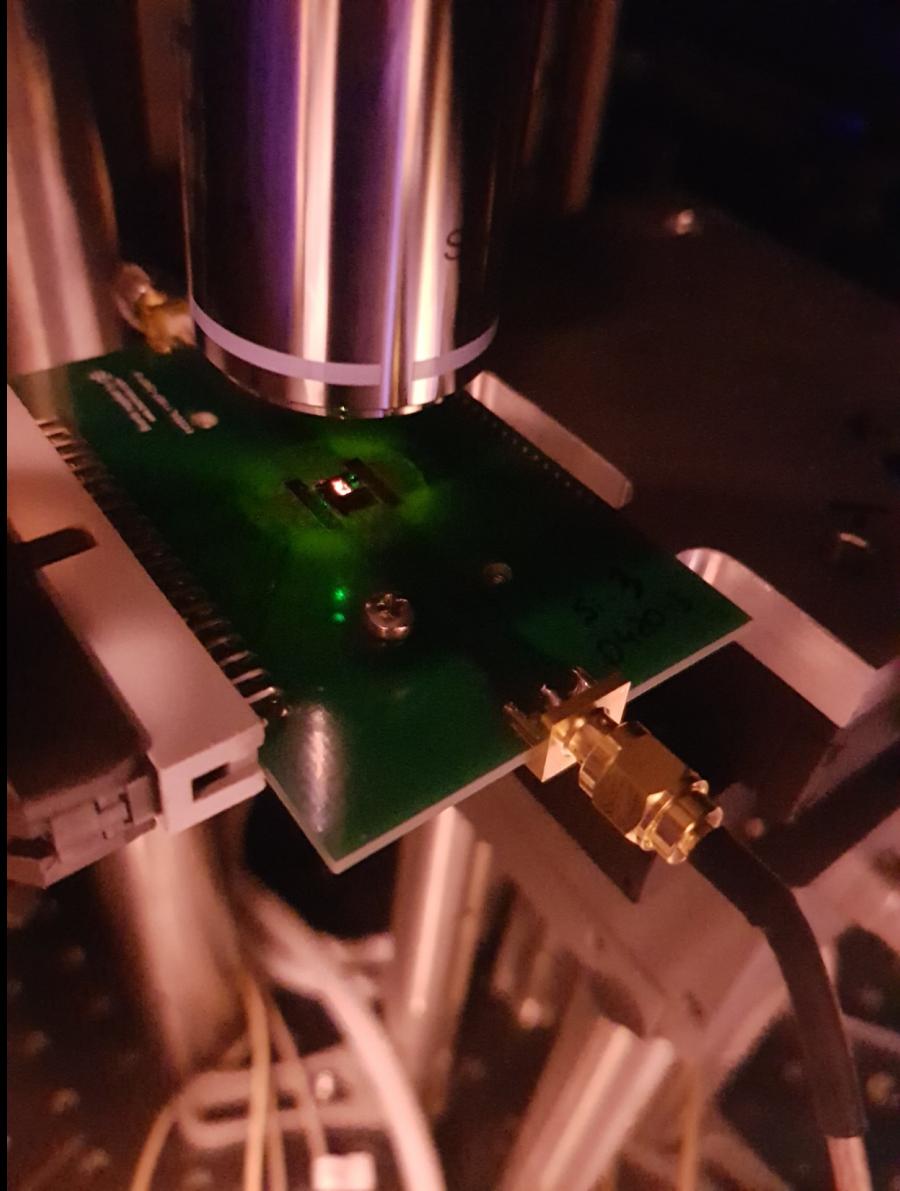
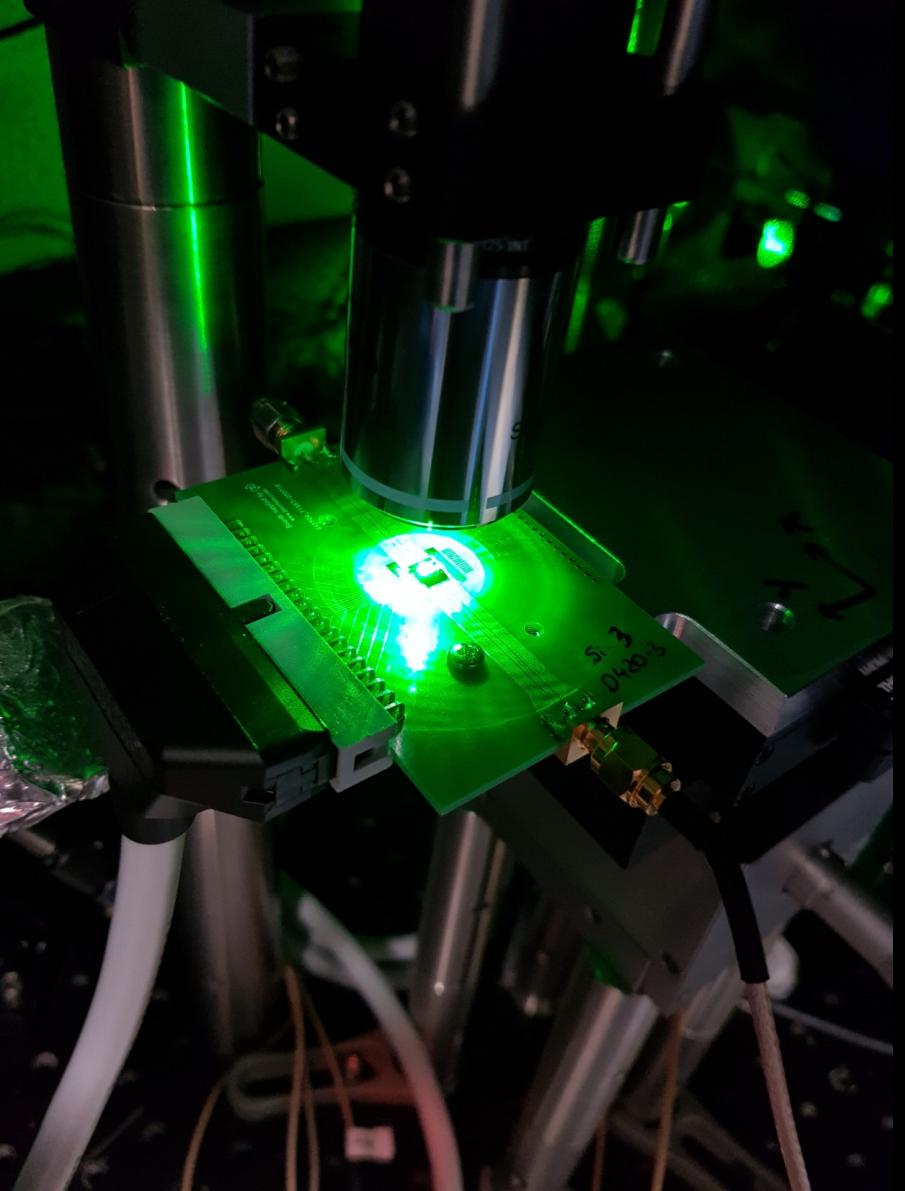


# Niveles cuánticos



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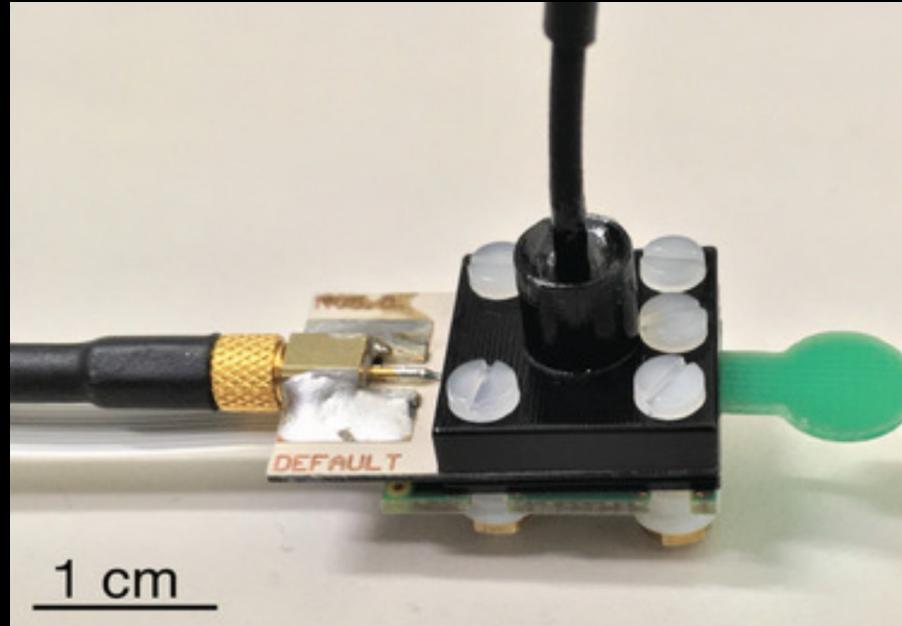


# Magnetómetros portables



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

Stürner *et al.* 2021





# Navegación

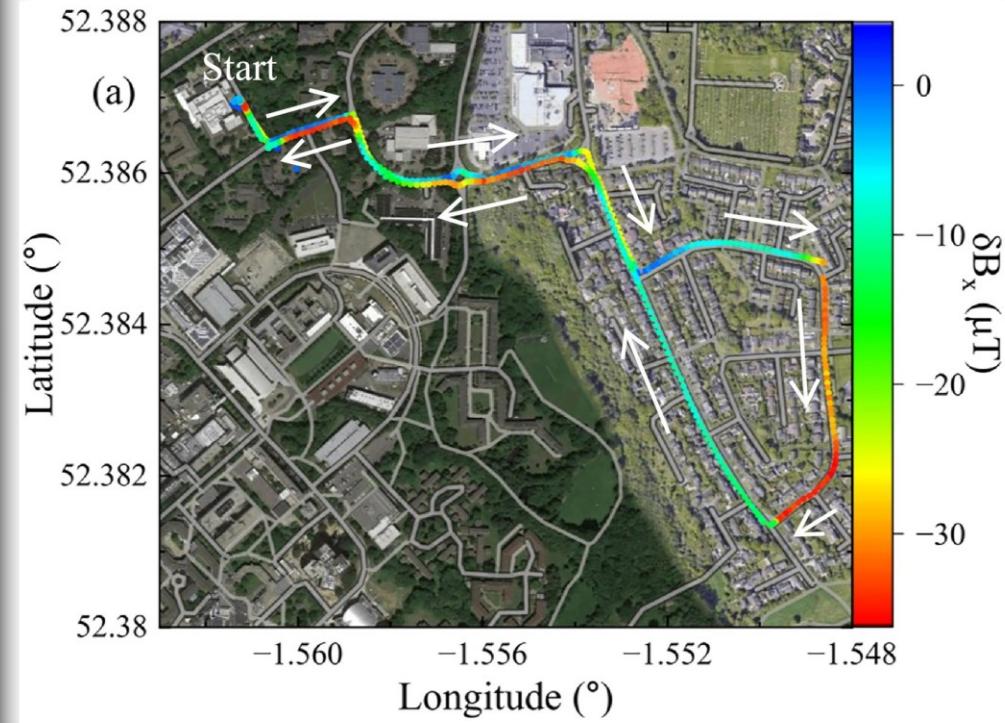


Artículo: "On the road with a diamond magnetometer"

Graham *et al.* 2025



# Navegación



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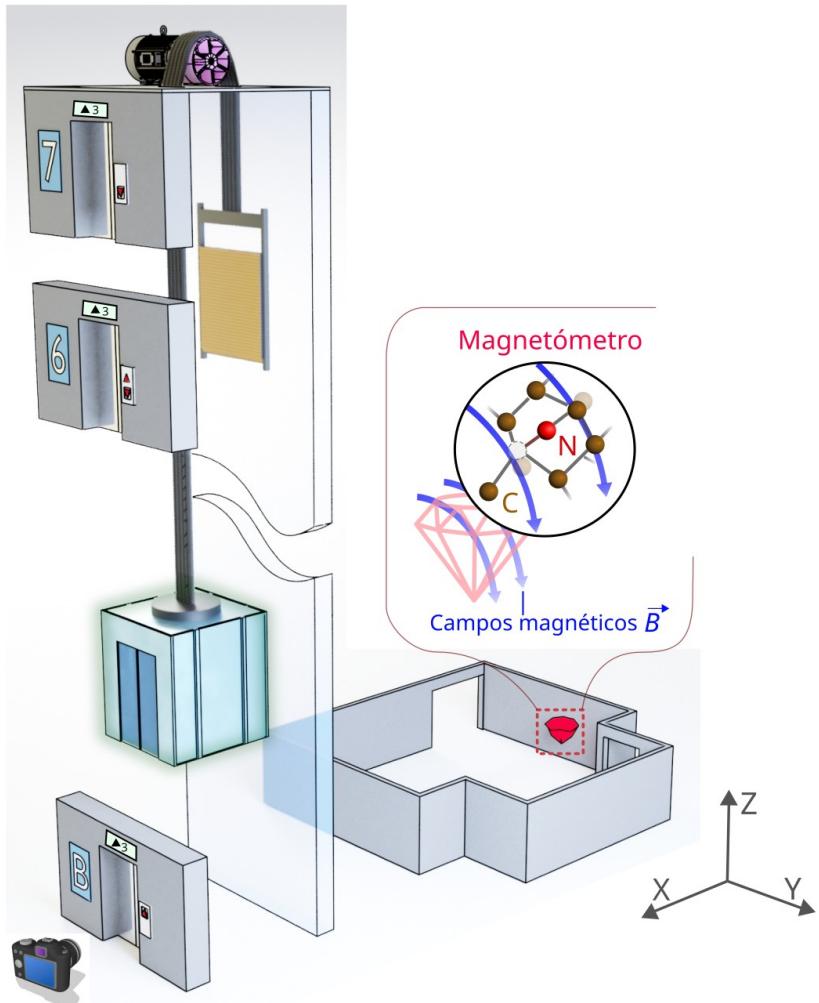


Artículo: “Machine learning assisted tracking of magnetic objects using quantum diamond magnetometry”

Meneses *et al.* 2025

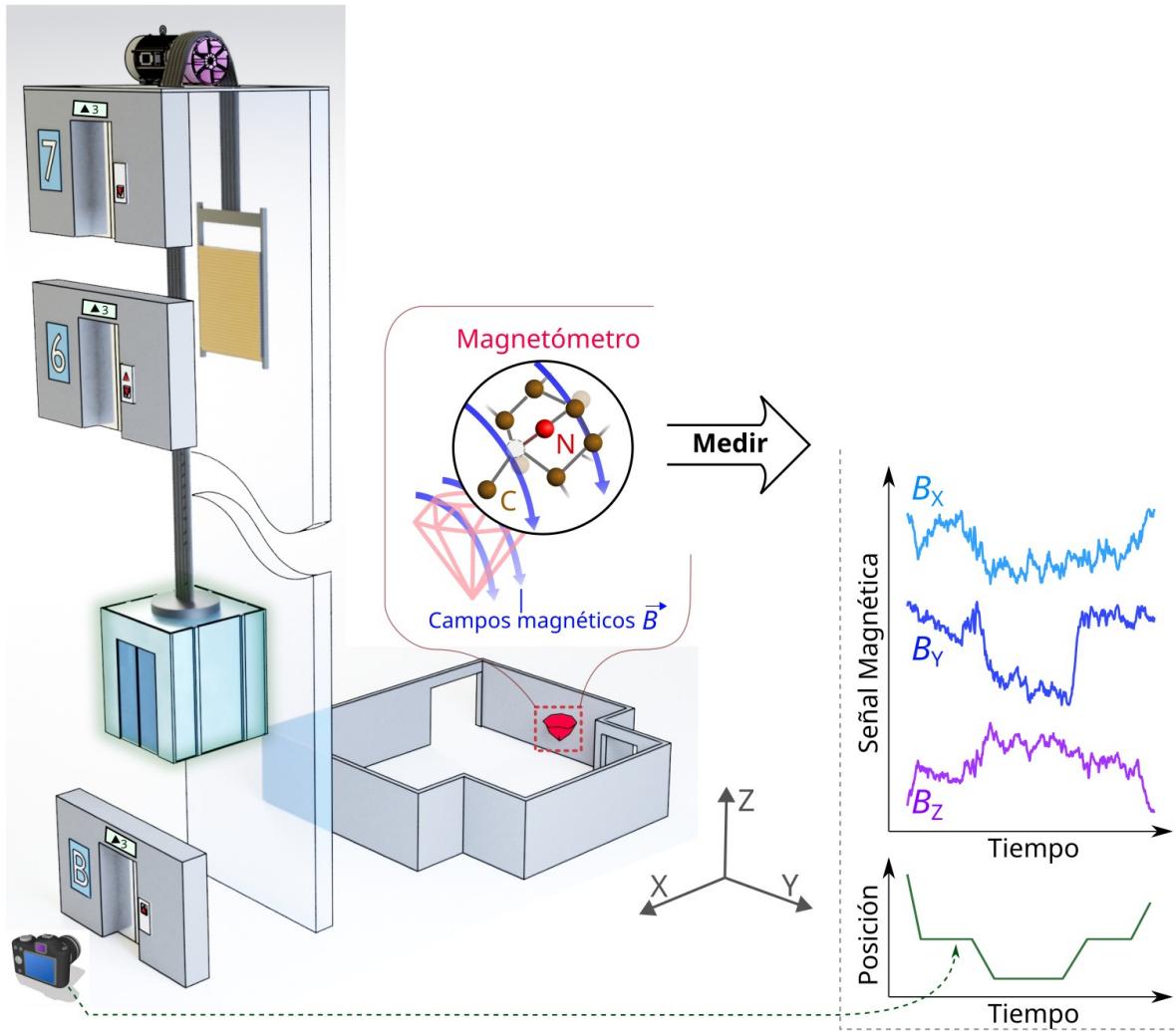


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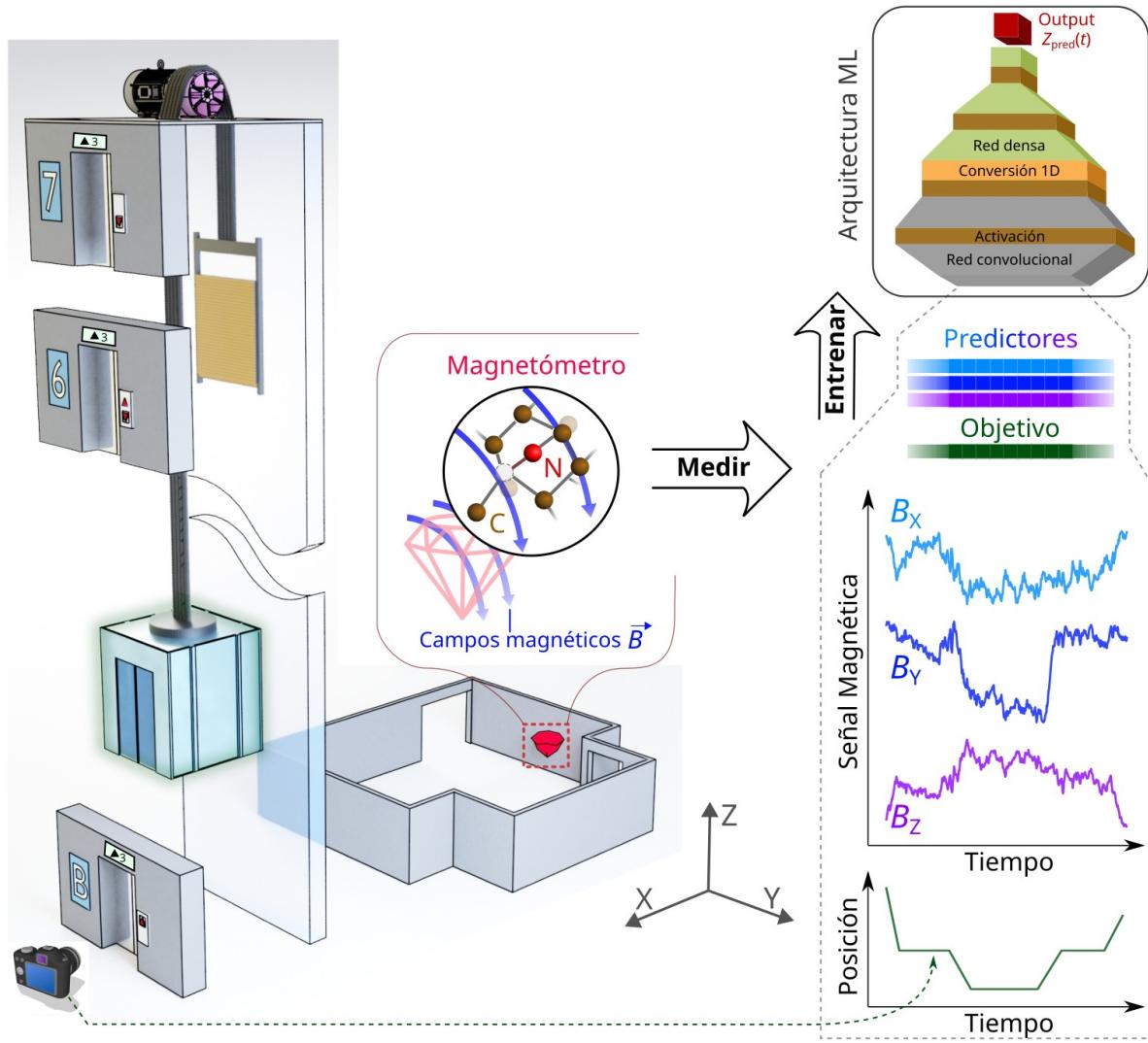


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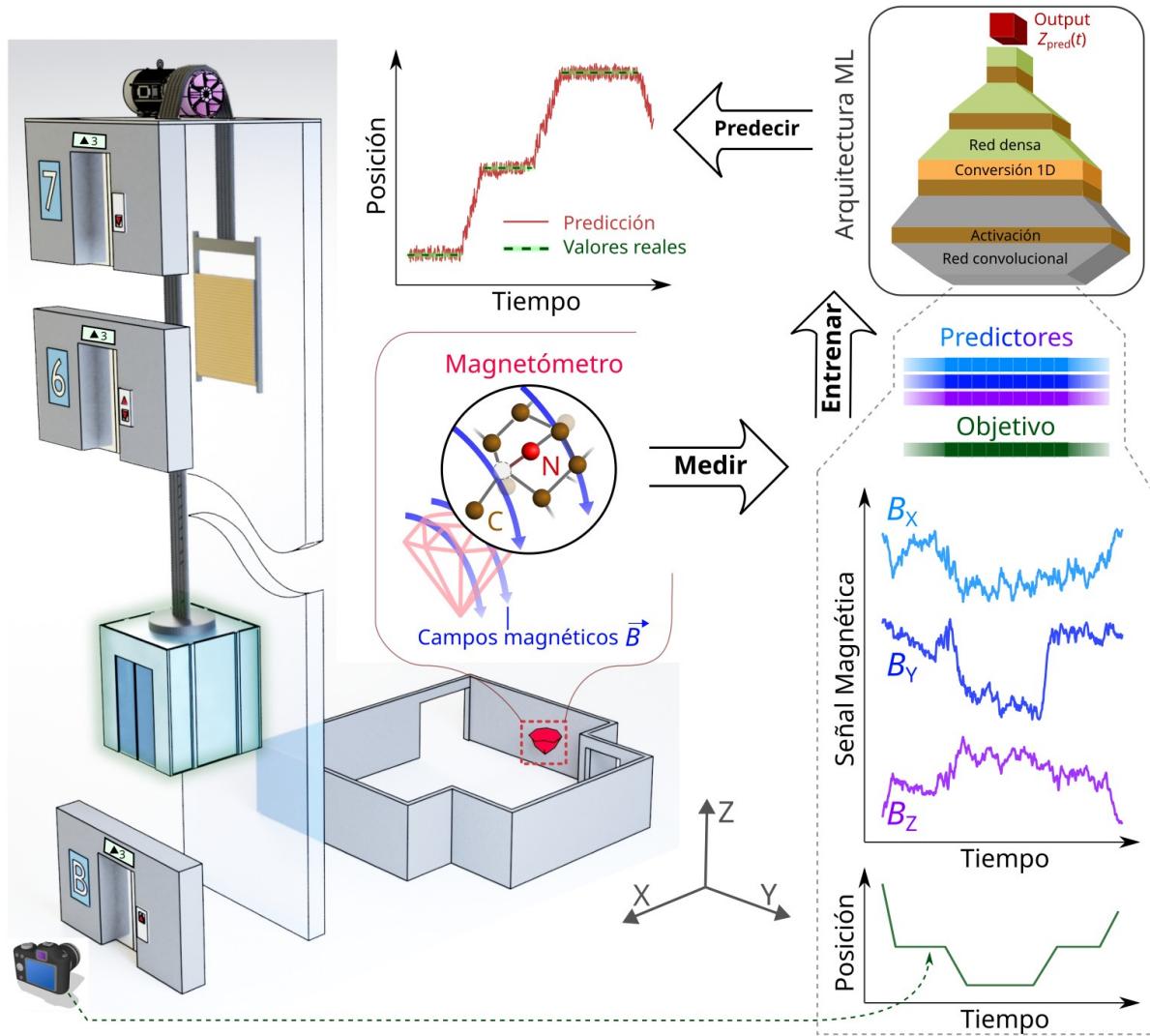
22



# Monitoreo



# Monitoreo



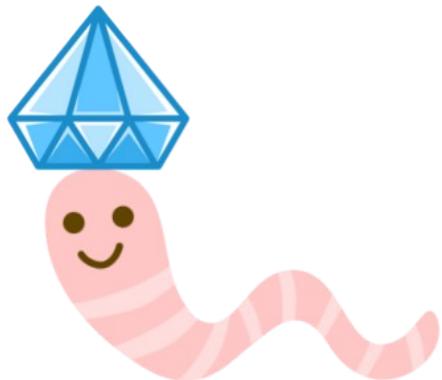


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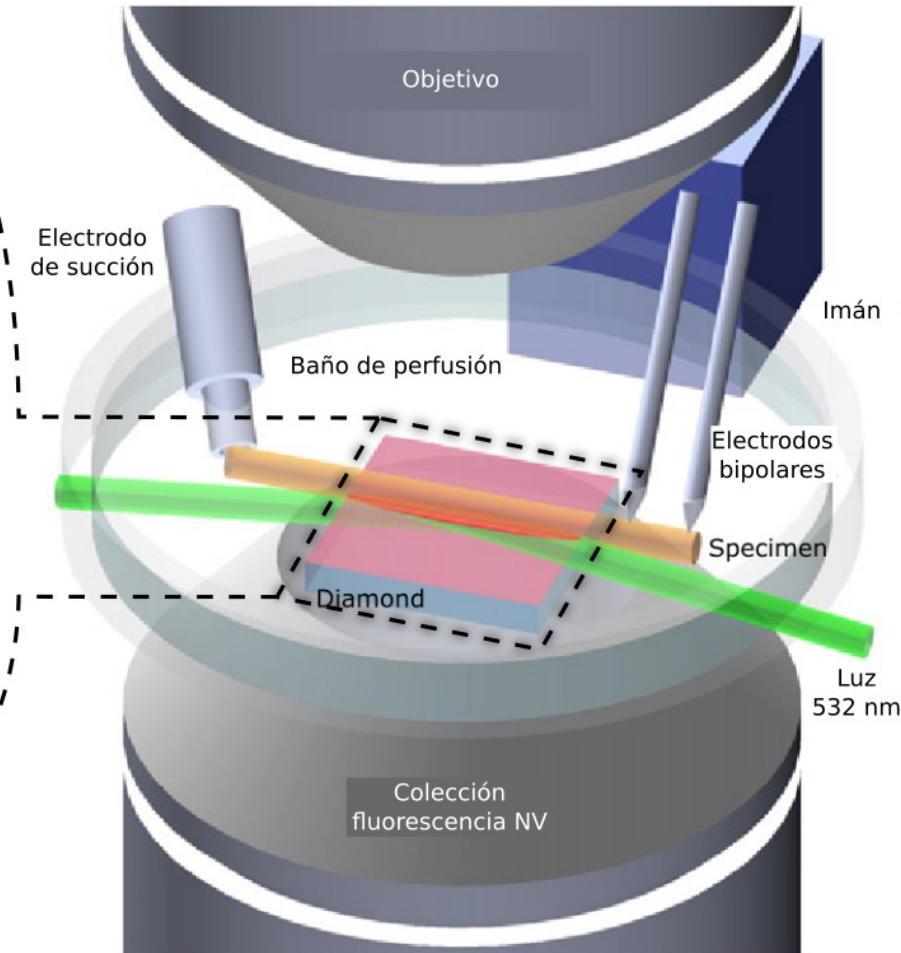
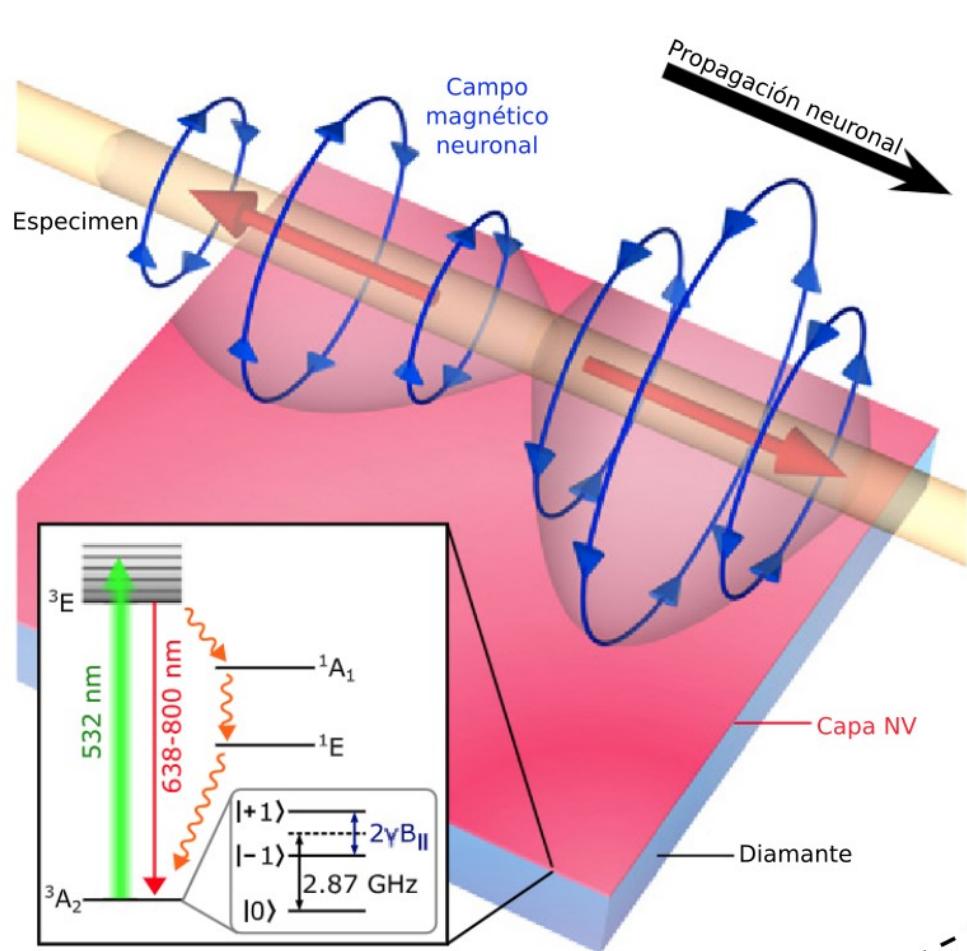
Artículo: “Optical magnetic detection of single-neuron action potentials using quantum defects in diamond”

Barry *et al.* 2016

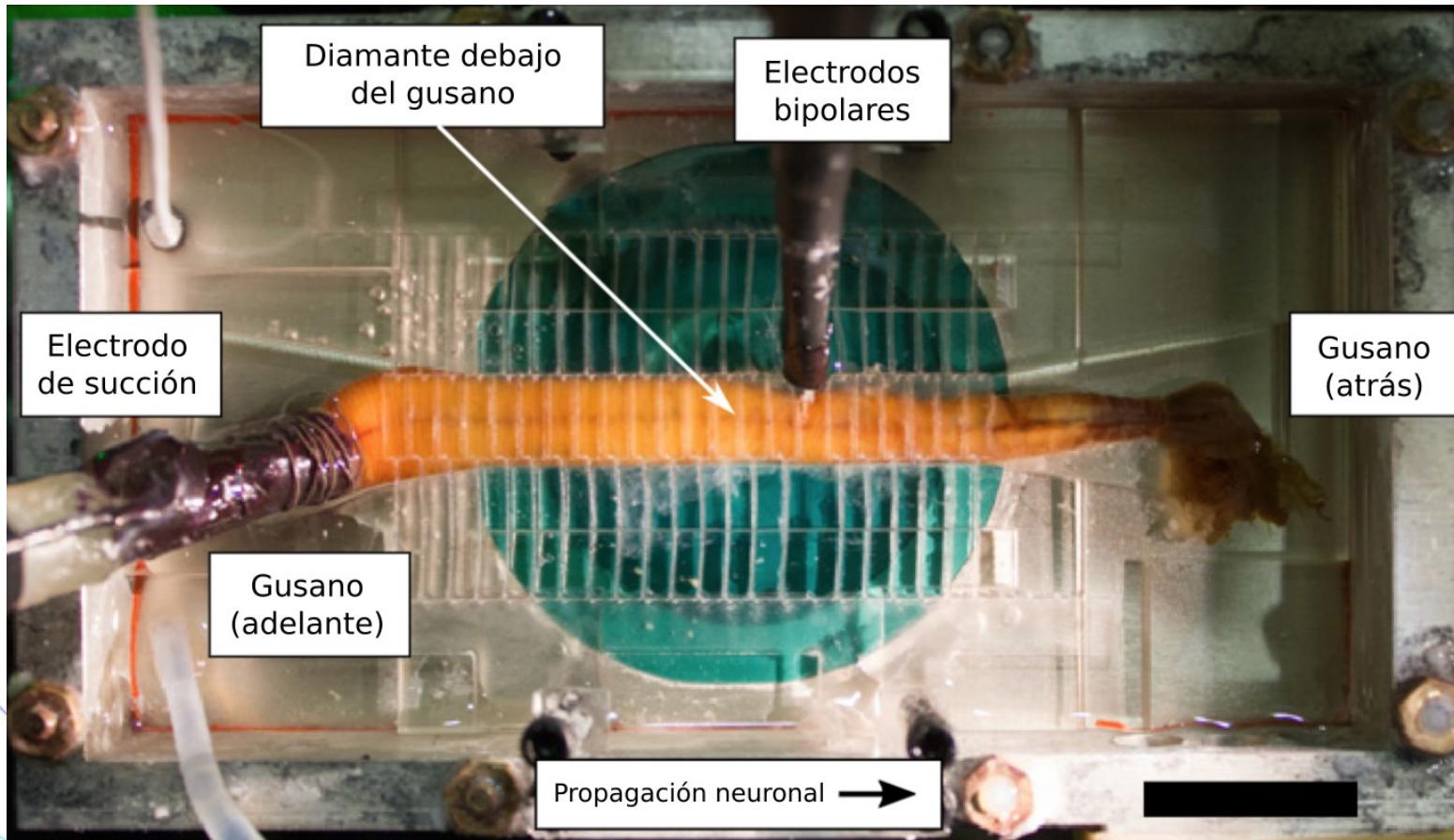


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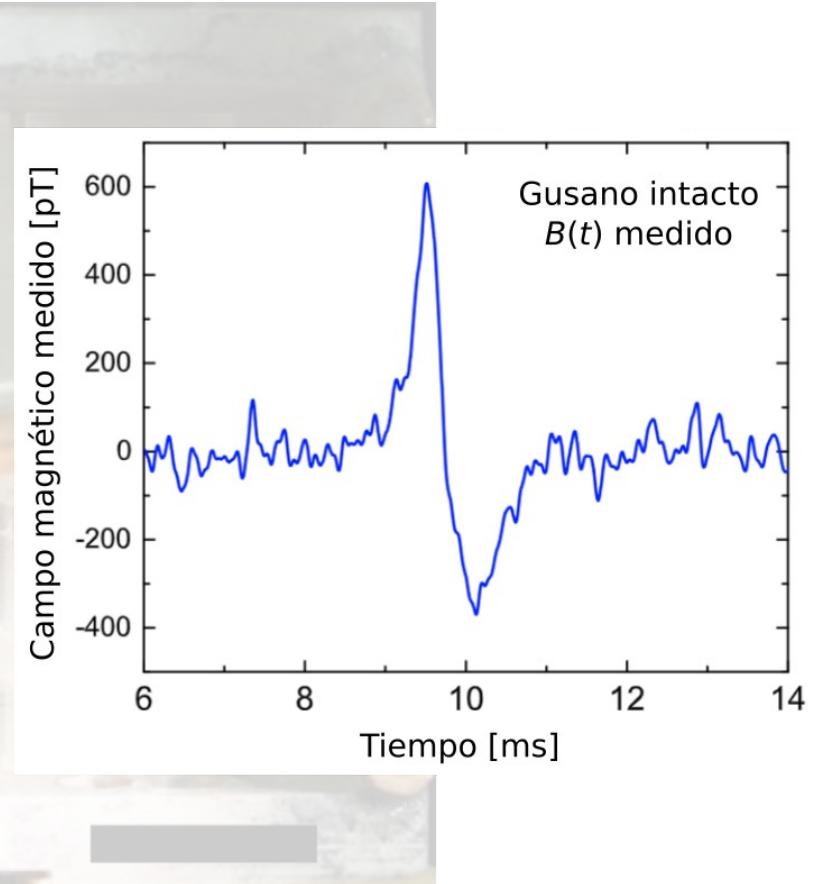
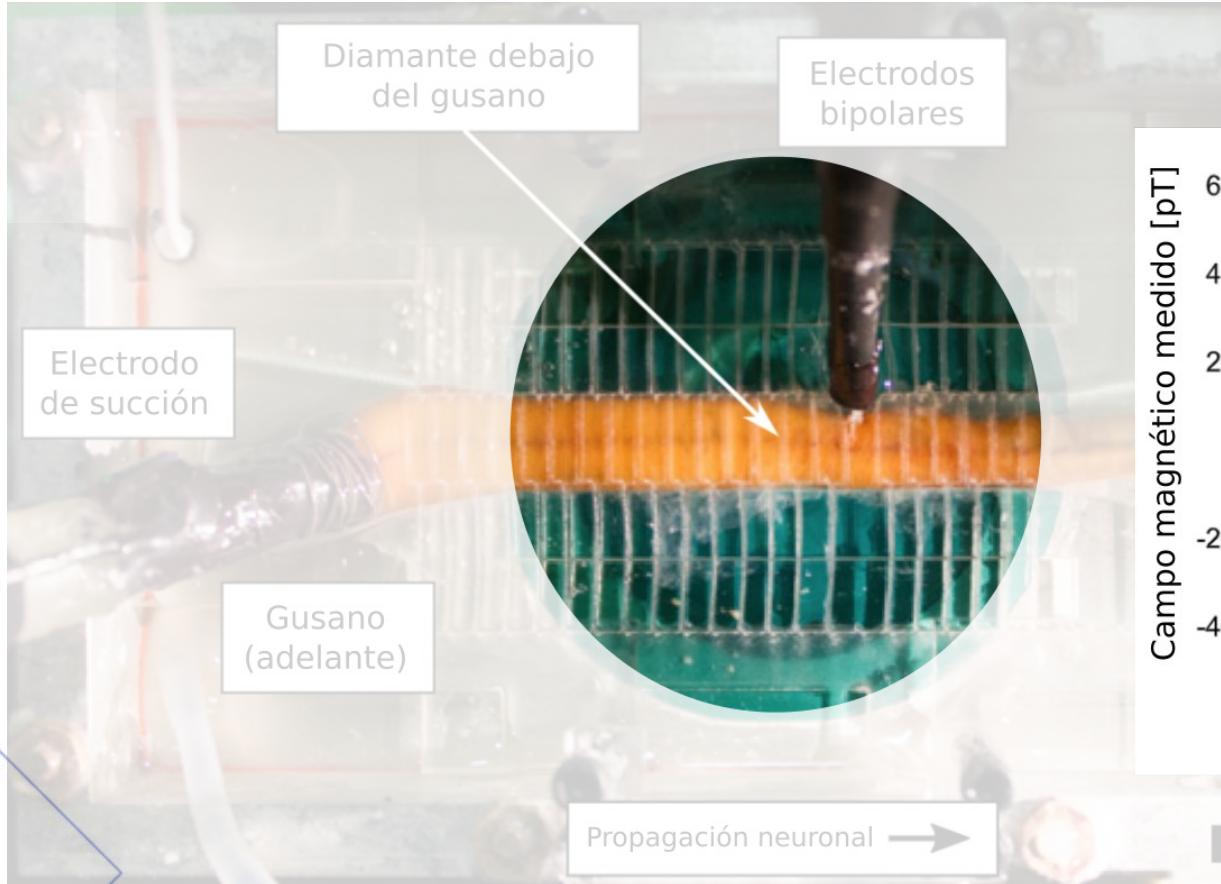
Barry et al. 2016



# Actividad Neuronal



# Actividad Neuronal



# Mapa de Actividad Neuronal



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

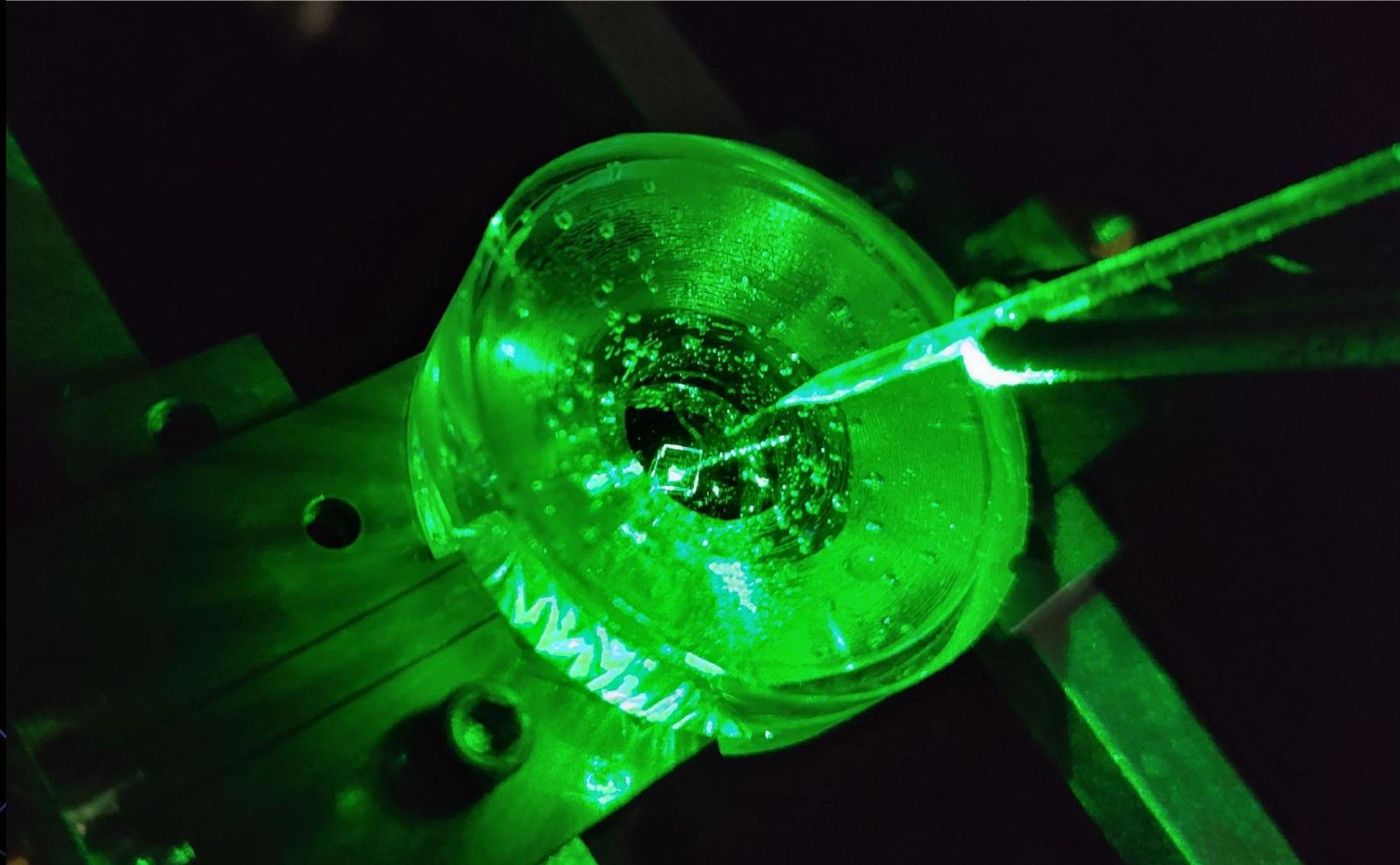
*Losero et al. 2023*



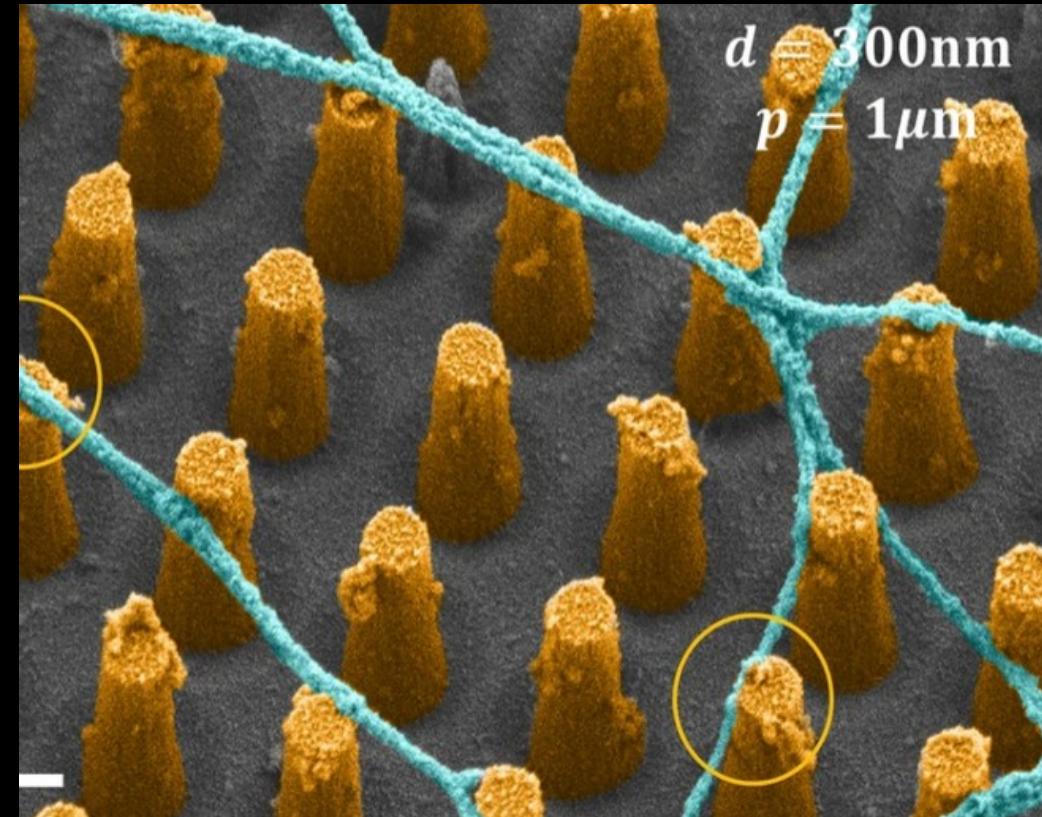
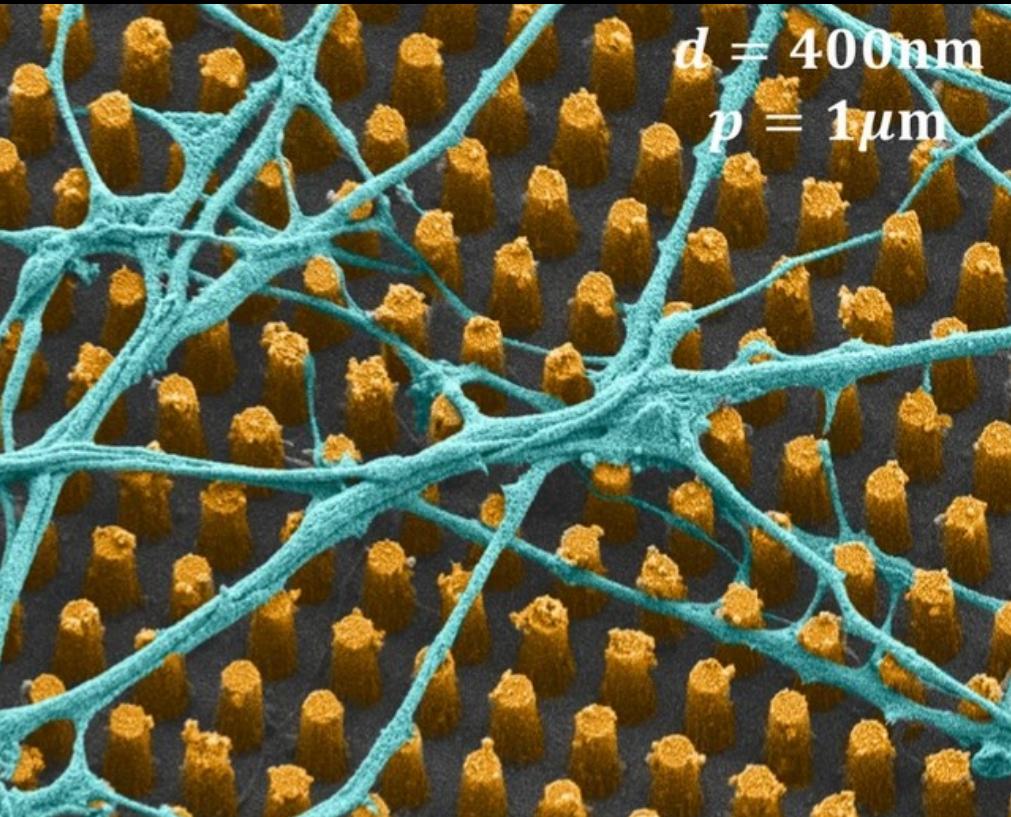
**Artículo: "A diamond voltage imaging microscope"**

*McCloskey et al. 2022*

# Mapa de Actividad Neuronal



# Mapa de Actividad Neuronal



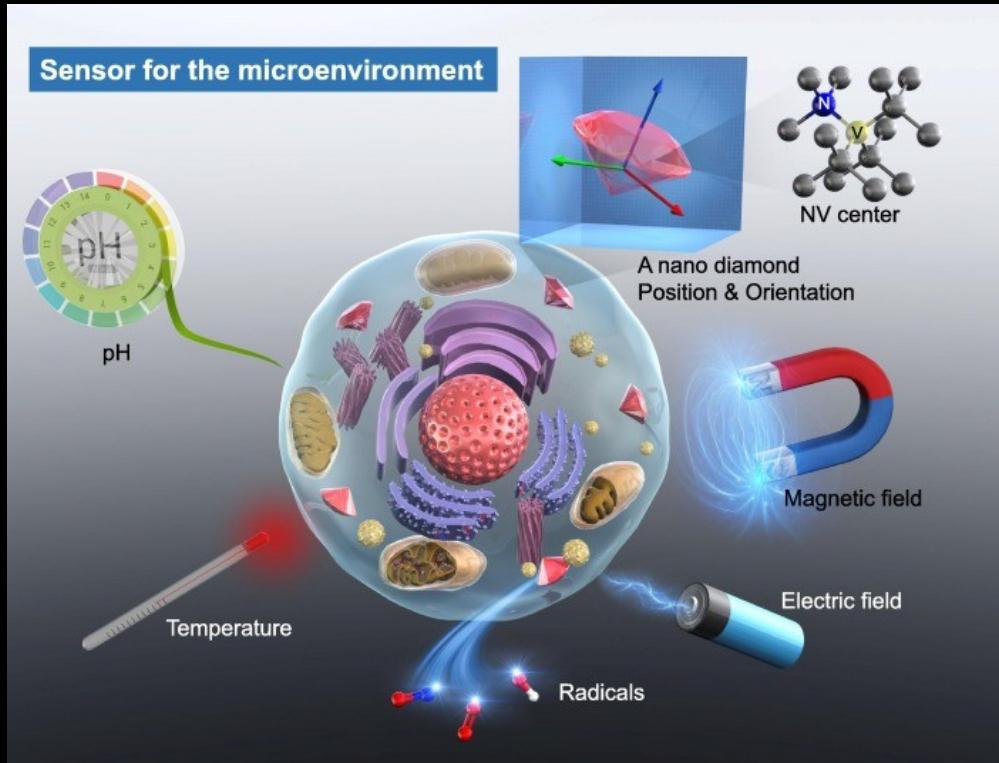


# Biosensores



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

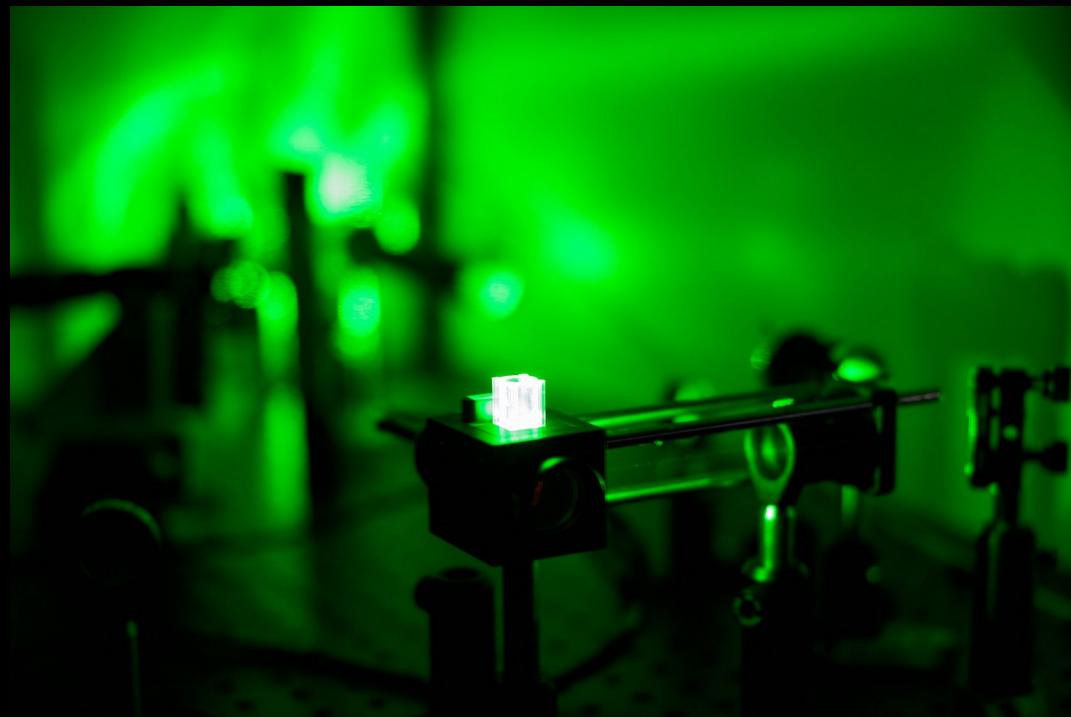
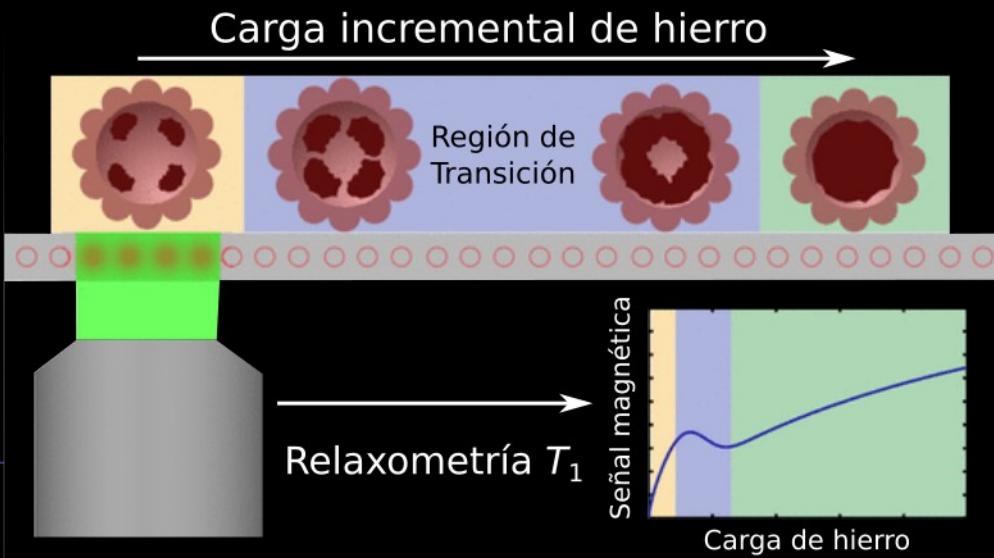
Tecnología cuántica para  
diagnósticos precisos

# Nanodiamantes para diagnóstico



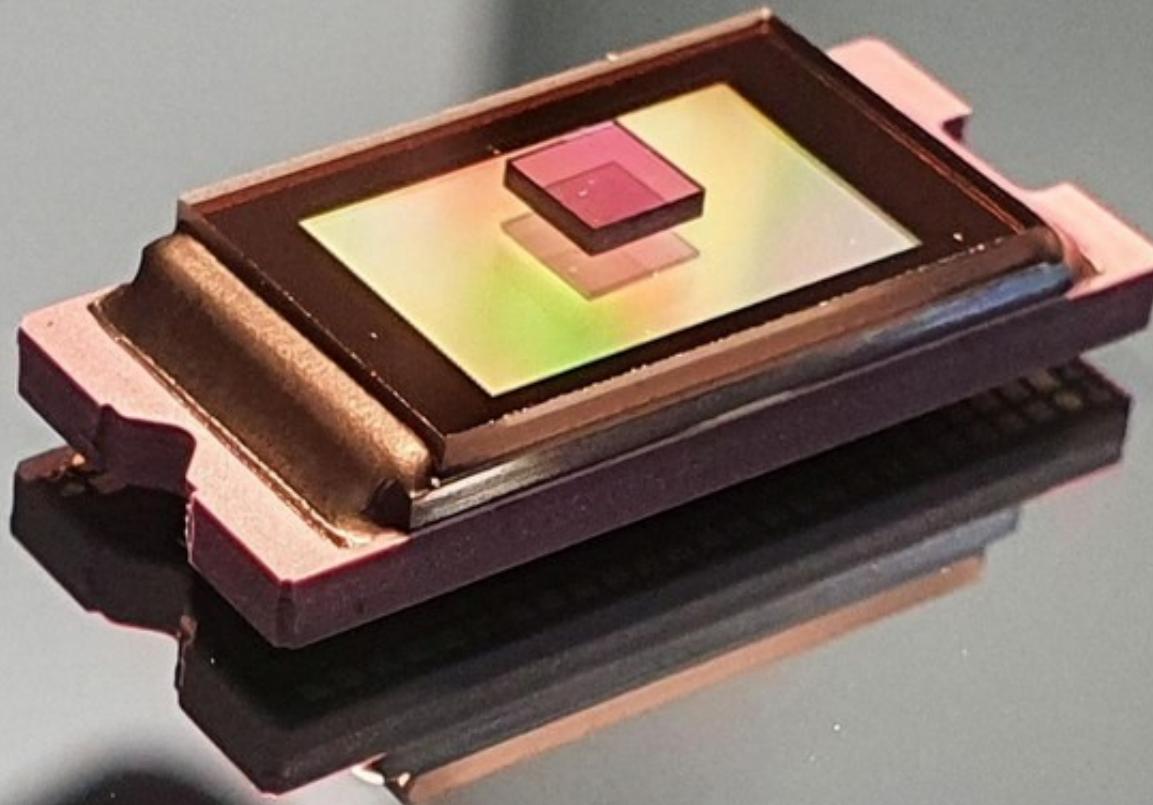
Artículo: "Nonmonotonic Superparamagnetic Behavior of the Ferritin Iron Core Revealed via Quantum Spin Relaxometry"

Grant *et al.* 2022

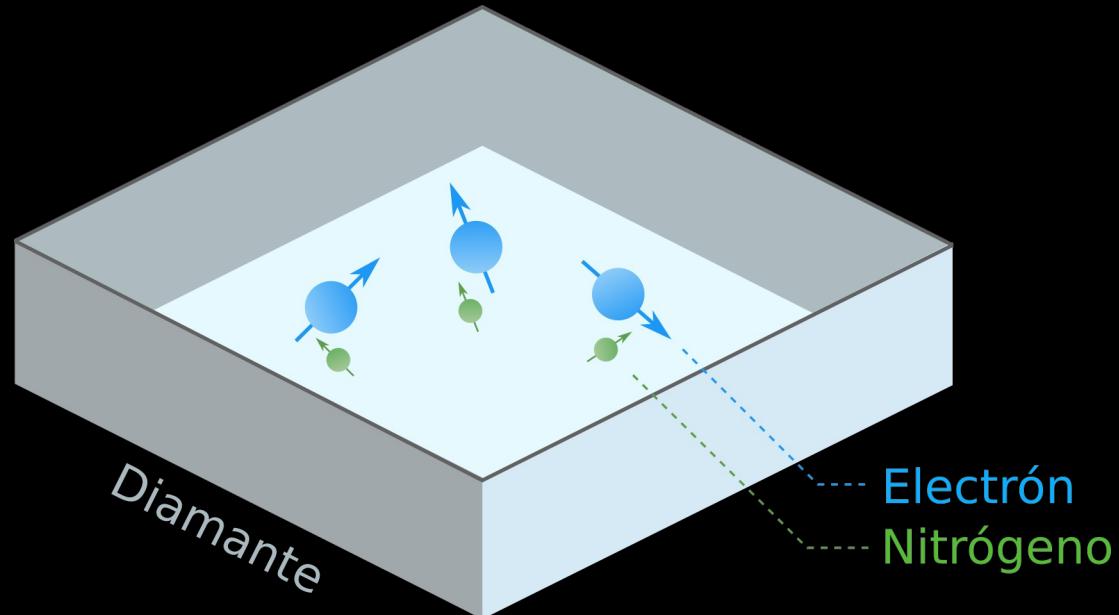




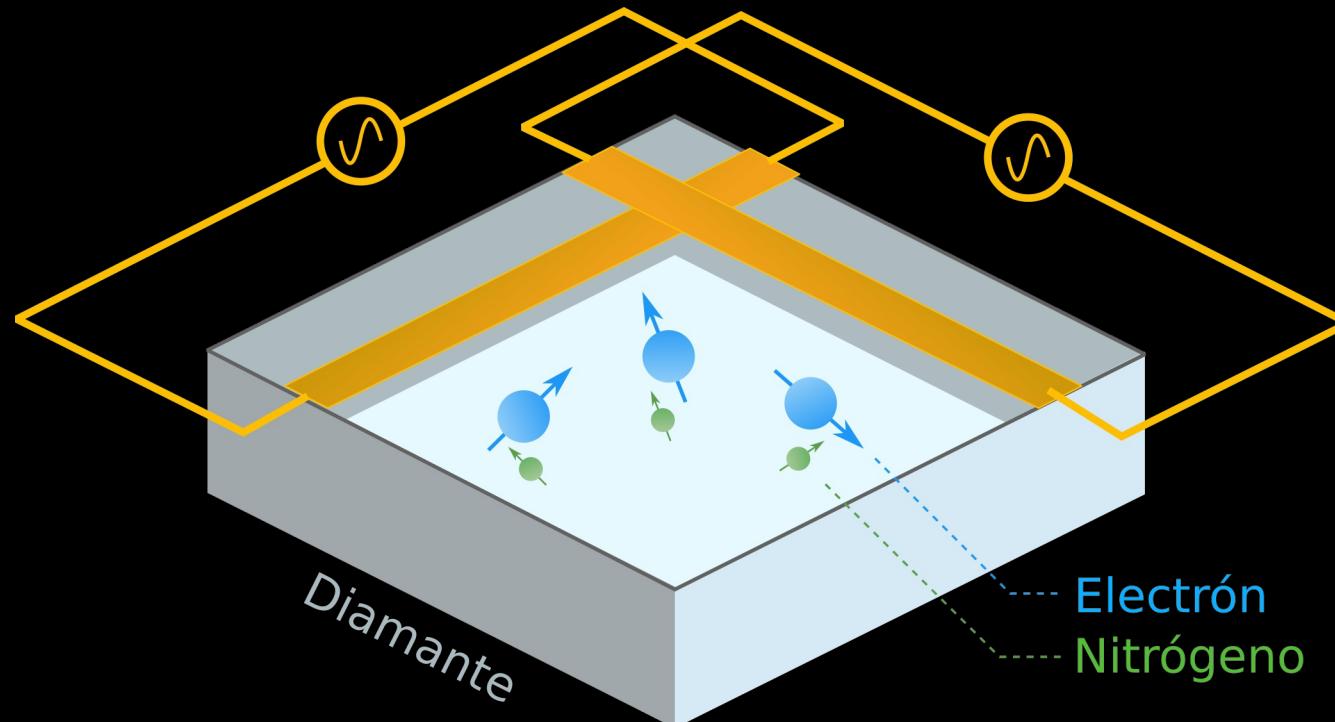
# Computación cuántica



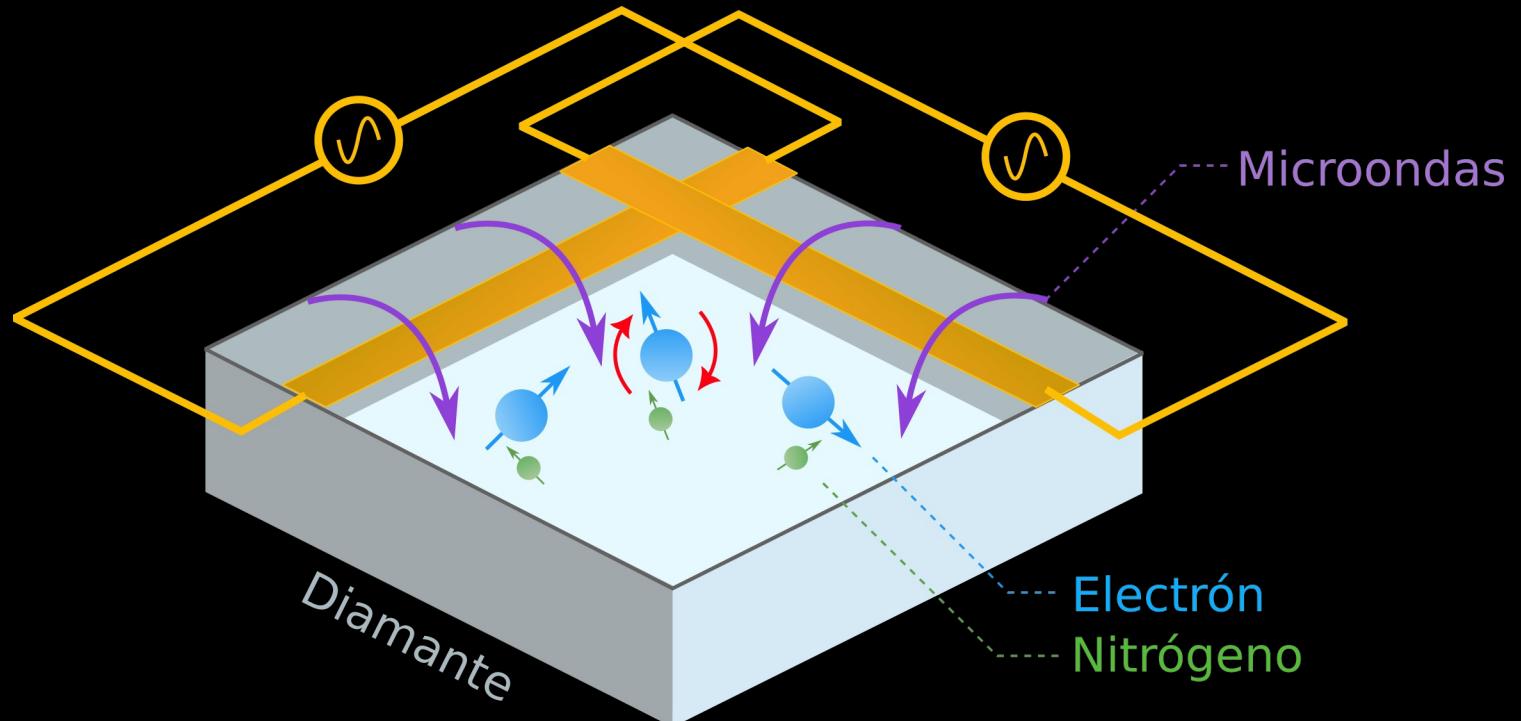
# Memoria cuántica



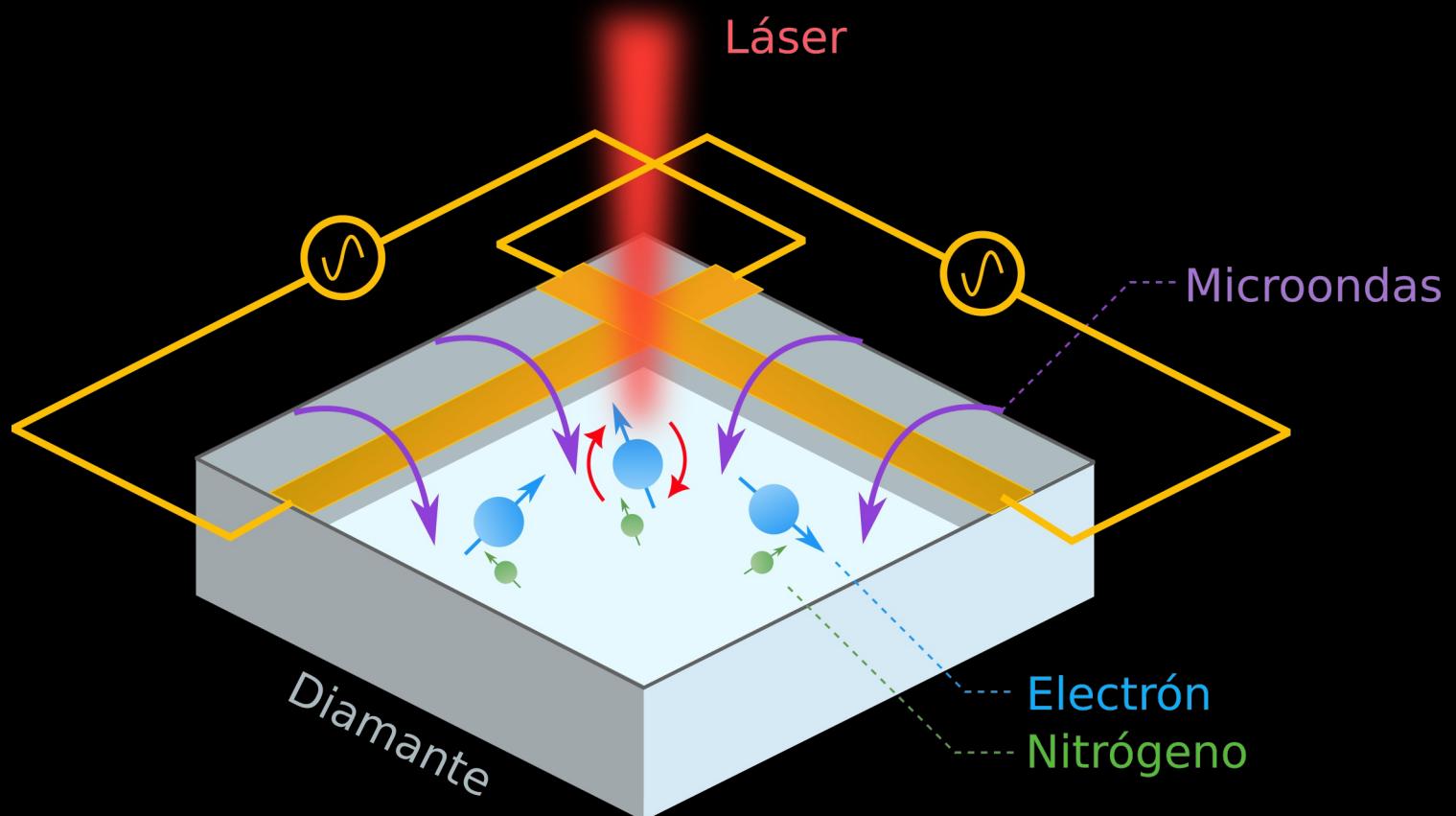
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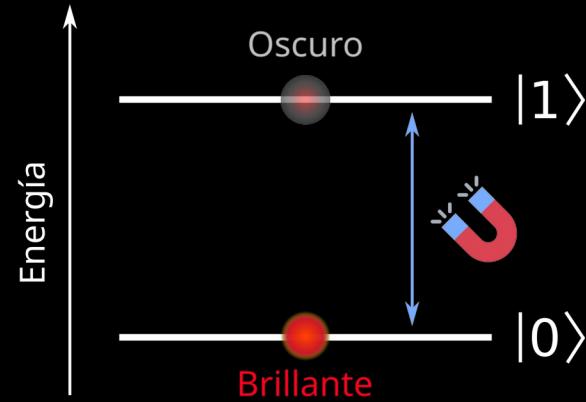
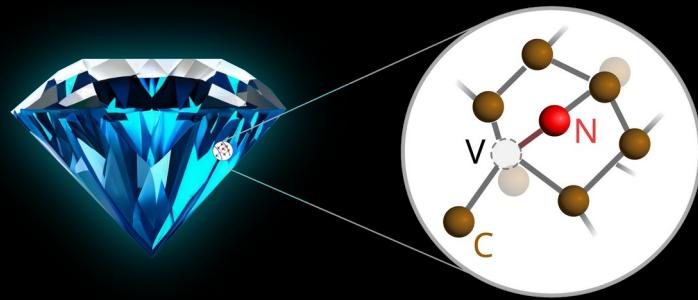
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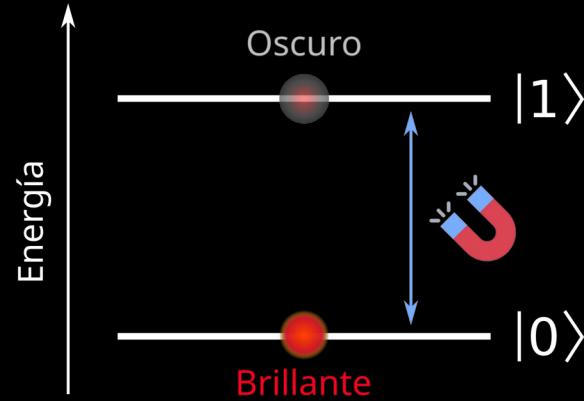
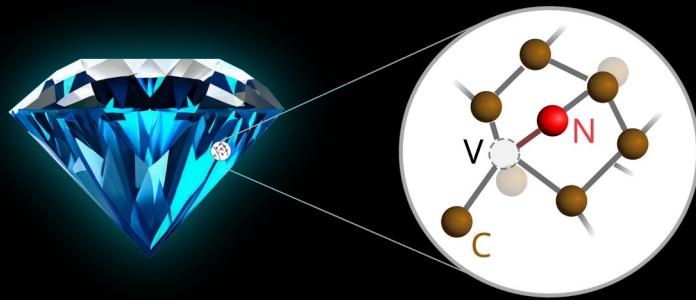
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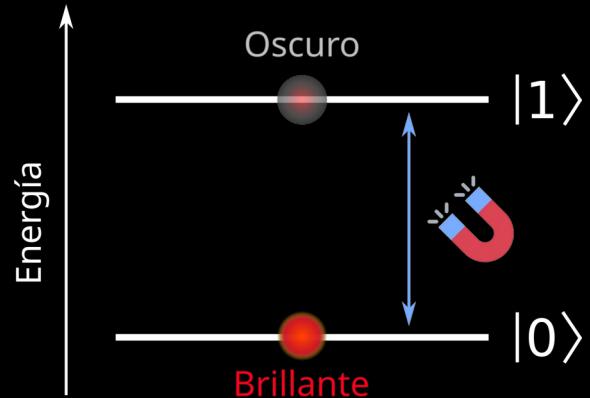
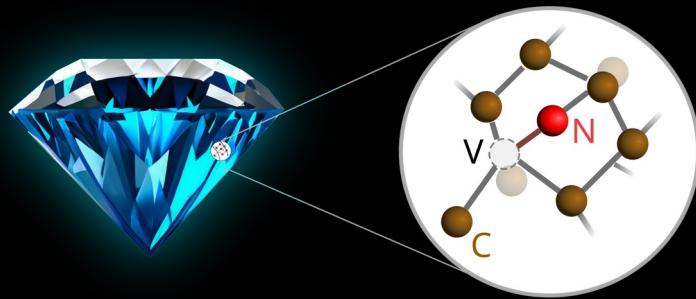
# Resumen



# Resumen



# ¡Gracias! ¿Preguntas?



Web/Contacto

