

# The ODMR Measurement Cycle

Optically Detected Magnetic Resonance in  $\text{NV}^-$  Centers

1

## Initialization

Green laser pulse (532 nm)

Spin polarized to  $|0\rangle$

via intersystem crossing

**Bright fluorescence**

2

## MW Control

Microwave pulse applied

Frequency  $\approx 2.87$  GHz

If resonant:  $|0\rangle \rightarrow |\pm 1\rangle$



**Coherent spin rotation**

3

## Sensing

Spin evolves freely

Accumulates phase from:

B-field, temperature,

**strain, electric field**

4

## Readout

Second green laser pulse

$|0\rangle \rightarrow$  Bright (more photons)

$|\pm 1\rangle \rightarrow$  Dim (fewer photons)

**Fluorescence = spin state**