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**Cavity quantum electrodynamics with quantum dots in microcavities**  
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**Citation**

Gudat, J. (2012, June 19). *Cavity quantum electrodynamics with quantum dots in microcavities*. *Casimir PhD Series*. Retrieved from <https://hdl.handle.net/1887/19553>

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**Author:** Gudat, Jan

**Title:** Cavity quantum electrodynamics with quantum dots in microcavities

**Issue Date:** 2012-06-19

Cavity Quantum Electrodynamics  
with  
Quantum Dots in Microcavities

Jan Gudat

Cover: The picture on the cover shows an optical cavity with a dipole inside. The curves in the background illustrate a cavity reflectivity measurement. The photon entering the cavity (from the left) interacts with the dipole. When the dipole is coupled to the cavity and the photon is interacting on resonance with a dipole electron spin, the photon gets reflected. This can be measured by a peak in the dip of the reflection (blue) curve. In the uncoupled case with the dipole being out of resonance, the photon gets transmitted and a dip in the reflection (red) curve can be observed. This simplified idea can be realized with a quantum dot in a microcavity, which could serve as the building block (a qubit) for a quantum computer.

**Cavity Quantum Electrodynamics  
with  
Quantum Dots in Microcavities**

PROEFSCHRIFT

ter verkrijging van  
de graad van Doctor aan de Universiteit Leiden,  
op gezag van Rector Magnificus prof. mr. P.F. van der Heijden,  
volgens besluit van het College voor Promoties  
te verdedigen op dinsdag 19 juni 2012  
klokke 10:00 uur

door

**Jan Gudat**

**Promotiecommissie:**

Promoter:	Prof. dr. D. Bouwmeester	Universiteit Leiden / University of California, Santa Barbara
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The work presented in this thesis has been made possible by financial support from the Marie-Curie Program No. EXT-CT-2006-042580.

Casimir PhD series, Delft-Leiden, 2012-15

ISBN: 978-90-8593-126-3

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