

FORM MPhil2**for use on examination of an****MPhil Degree****(examined by Thesis and Oral Examination only)****UNIVERSITY OF
CAMBRIDGE**

Board of Graduate Studies

Examiners' joint report and recommendation(to be completed *after* the oral examination)

Candidate	Examiners	Date of report
EOIN MURRAY	Prof. CHARLES G. SMITH	12/4/2016
	Prof. BRIAN GERADOT	

1. Please write your **Joint Report** of the Oral examination below; if you prefer to attach the report on a separate sheet, please sign and date the sheet.
2. Please complete the **Recommendation** form overleaf

The candidate clearly explained the motivation, experiment and results in the thesis. He clearly explained his contributions to the work. Some minor corrections are requested to the thesis including adding slight more detail to the figure captions. The thesis report was limited to Toshiba Research Laboratory quantity what could be revealed. The results were novel and interesting and we recommend the candidate is awarded the MPhil.

If you have written your report on this sheet, please now **sign and date** this form and submit it, together with your independent reports and other papers to the Degree Subject Committee office after the oral examination.

This Form will be made available to the candidate and their supervisor when the Board of Graduate Studies communicates the result to the candidate.

Signed		Date
Internal Examiner	<i>Charles G. Smith</i>	12/4/2016
External Examiner	<i>B. Geradot</i>	12/4/2016



Please Turn Over

Joint Recommendation – MPhil Degree Thesis Examination

Please indicate your joint recommendation by circling the appropriate number on the table below; you may wish to refer to the *Guide to Examiners* or the Degree Committee Secretary for guidance.

N.B. If you do not agree in your recommendation, or if this recommendation differs from those in either of your Independent Reports, please see the *Guide to Examiners* or the Degree Committee Secretary for instructions on how to proceed.

The thesis is satisfactory for the award of the MPhil Degree	
1	Approved for the MPhil Degree <i>without correction</i>
2	Approved for the MPhil Degree <i>subject to corrections</i> <ul style="list-style-type: none"> If the corrections have already been made to your satisfaction, please initial and date here (either or both Examiners): <div style="border: 1px solid black; height: 60px; width: 100%;"></div> If corrections are to be completed in future, please indicate which examiners will be responsible for checking them: <div style="border: 1px solid black; padding: 5px;"> <input checked="" type="radio"/> Internal <input type="radio"/> External <input type="radio"/> both Examiner(s) (delete as appropriate) </div>
The candidate is not to be approved for the MPhil Degree	
3	Not be approved for the MPhil Degree - outright failure

Signed		Date
Internal Examiner		12/4/2016
External Examiner		12/4/2016

FORM MPhil1***for use on examination of an******MPhil Degree******(examined by Thesis and Oral Examination only)*****UNIVERSITY OF
CAMBRIDGE**

Board of Graduate Studies

Examiner's independent report and recommendation
(to be completed *before the* oral examination)

Candidate	Examiner	Date of report
Eoin Murray	Prof. Brian Gerardot	11/04/2016

1. Please attach this form to your **Independent Report** on the thesis; please sign and date the report. Please note that **your report will be made available to the candidate and their supervisor** after the Board of Graduate Studies has communicated the overall result to the candidate.
2. Please indicate your recommendation by circling the appropriate number on the table below; you may wish to refer to the *Guide to Examiners* or the Degree Committee Secretary for guidance.

The thesis is satisfactory for the award of the MPhil Degree	
1	<i>Approved for the MPhil Degree without correction</i>
2	<i>Approved for the MPhil Degree subject to corrections</i> X
3	<i>Not be approved for the MPhil degree - outright failure</i>
4	<i>I wish to reserve judgement on the outcome until after the oral examination</i>

Please now **sign and date** this form and submit it, together with the other papers if appropriate, to the Degree Committee office after the oral examination.

Signed <i>Brian Gerardot</i>	Date 11/04/2016
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MPhil thesis by Eoin Murray

External examiner report by Brian Gerardot 11th April, 2016

Pre-oral examination report: The thesis by E. Murray reports the fabrication and characterization of a hybrid quantum photonic chip consisting of a III-V quantum dot sample directly bonded to a SiON waveguide. First, the motivation for the project is explained and the design considerations and the results are presented. The results, which have led to a first author publication in APL, are novel and highly interesting to growing quantum photonics and quantum information processing communities. While there are aspects of the thesis that could be improved with further clarification and elaboration, the writing is coherent, the results appear technically correct, and the thesis is of overall good standard. The thesis is quite brief considering the amount of work the student appears to have performed. During the examination I will probe the student's understanding of some of the underlying physics and also try to ascertain which aspects of the research were achieved independently (or primarily) by the student (as the project is embedded in a large successful team).

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Examiner's independent report and recommendation
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Candidate	Examiner	Date of report
Eoin Murray	CHARLES G. SMITH	11 April 2016

1. Please attach this form to your **Independent Report** on the thesis; please sign and date the report. Please note that **your report will be made available to the candidate and their supervisor** after the Board of Graduate Studies has communicated the overall result to the candidate.
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2	Approved for the MPhil Degree <i>subject to corrections</i>
3	<i>Not be approved for the MPhil degree</i> - outright failure
4	I wish to reserve judgement on the outcome until after the oral examination

Please now **sign and date** this form and submit it, together with the other papers if appropriate, to the Degree Committee office after the oral examination.

Signed		Date	11 / April 2016
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UNIVERSITY OF CAMBRIDGE

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Semiconductor Physics
Cavendish Laboratory
Madingley Road
Cambridge CB3 0HE
United Kingdom
11th April 2016

Department of Physics

**Report by the internal examiner,
Professor Charles G. Smith, on the MPhil degree report of Eoin Murray
Title: Integration of quantum dot light sources**

This report covers research on using the construction and use of on chip wave guides that have potential uses in quantum computing. The wave guides are coupled to InAs quantum dots that generate photons. The candidate modeled the device behavior as well as performing characterization measurements of the coupling between photons in two wave guides as a function of length and the coupling as a function of optical wavelength and voltage applied to a heater which changes the refractive index of one arm of the coupler device. The performance of a Mach Zender interferometer was tested and the second order correlation was measured for pulsed generation of photons showing single photon generation with a low correlation count for small time differences.

There is a very good section outlining the background research on quantum dots as photon sources and optical wave guide physics. The design of the devices is well described and modelled and the results are clearly displayed and a detailed discussion of their significance is given. There is a good conclusion suggesting further work and device improvements. The report is very clearly written with good use of figures and diagrams.

There are good novel results presented and for this and the above reason I suggest the candidate should be awarded the MPhil with no corrections to the report.

A handwritten signature in purple ink, appearing to read 'Charles G. Smith'.

Professor Charles G. Smith