Mechanisms for industry-university interaction

Spectrum of interactions

University must satisfy TWO customers (company & government)

IMMEDIACY

LEVERAGE

- All costs paid by company
- Immediate impact

- Majority of costs paid by public funds
- More fundamental research (longer term)

KTP

EngD

TSB funded collaborative research projects

Consultancy

EU Framework

EPSRC grant funding

Directly funded research contracts

EPSRC CASE studentships

Customer expectations

Company wants

- Solutions to problems
- Access to and evaluation of new and emerging technologies
- Exploitable IP
- Access to expertise
- Access to test equipment / facilities
- Trained people

Government wants

- High quality publications (international measure of research quality)
- ‘Impact’
- Contribution to funding
- Universities to deal with real-world problems
- Trained people

EPSRC funded research

Projects typically funded for 3 years

Variety of mechanisms for winning funding, in general:

- detailed proposal; feedback on award after approx 6 months

Company provides

- Partial funding (typically mostly in-kind)
- Expertise
- Access to equipment / facilities
- Focus on a real problem

EPSRC provides

- Majority funding

Company gets

- Long-term capability
- Early access to novel technology, IP
- Generic solutions

EPSRC expects

- Dissemination via high quality publication
- Longer term impact

Technology Strategy Board (TSB) funded collaborative research

- Industry-led projects
- Research carried out both at the company and at the university – real collaboration
- Calls for proposals usually focused around particular themes
  - 2-stage proposal process
  - Reasonably fast turnaround times
- Most projects funded 50% overall
- However if university involved, requires funding at 100% level, reducing the % funding level for other partner(s)

EU Framework similar, but with more partners and more countries involved in a single project…

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Heriot Watt University

Engineering Doctorate (EngD)

- Industry-centred PhD working on company-driven research
- Research Engineer (student) spends 40 - 75% of their time working at the company over the 4 years
- Research Engineer can undertake a number of smaller projects, rather than one large project, if appropriate
- EPSRC funding is also available to support current company employees to complete the EngD - ‘industrial studentship’ scheme
  - Staff retention

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EngD coursework

Coursework drawn from:

- MScs in three themes
  - Photonics and Optoelectronic Devices (St Andrews)
  - Vision Image and Signal Processing
  - Microsystems
- business courses taken from the HW Edinburgh Business School MBA
  - ‘MBA lite’

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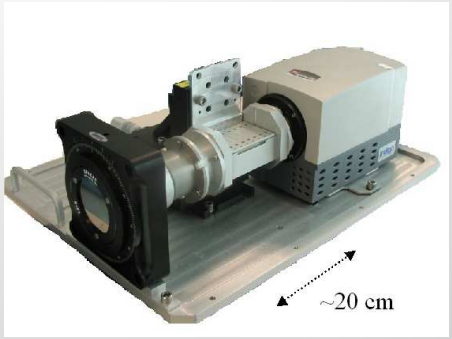
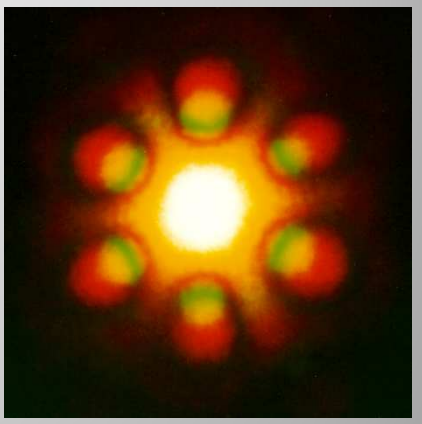
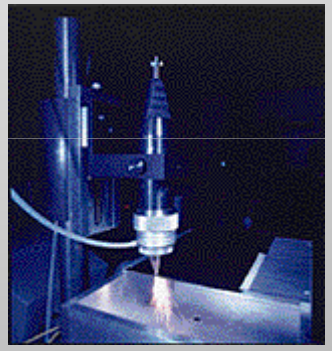
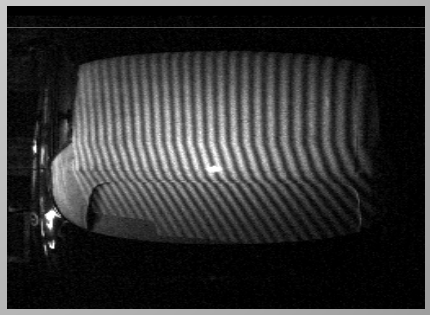
EngD - typical projects

- Exploitation of University or Company IP
- Development of industry expertise or product
  - High risk
  - New market opportunities
- Ideally
  - Research Engineer spends significant time in both Company and University
  - But determined by needs of the project









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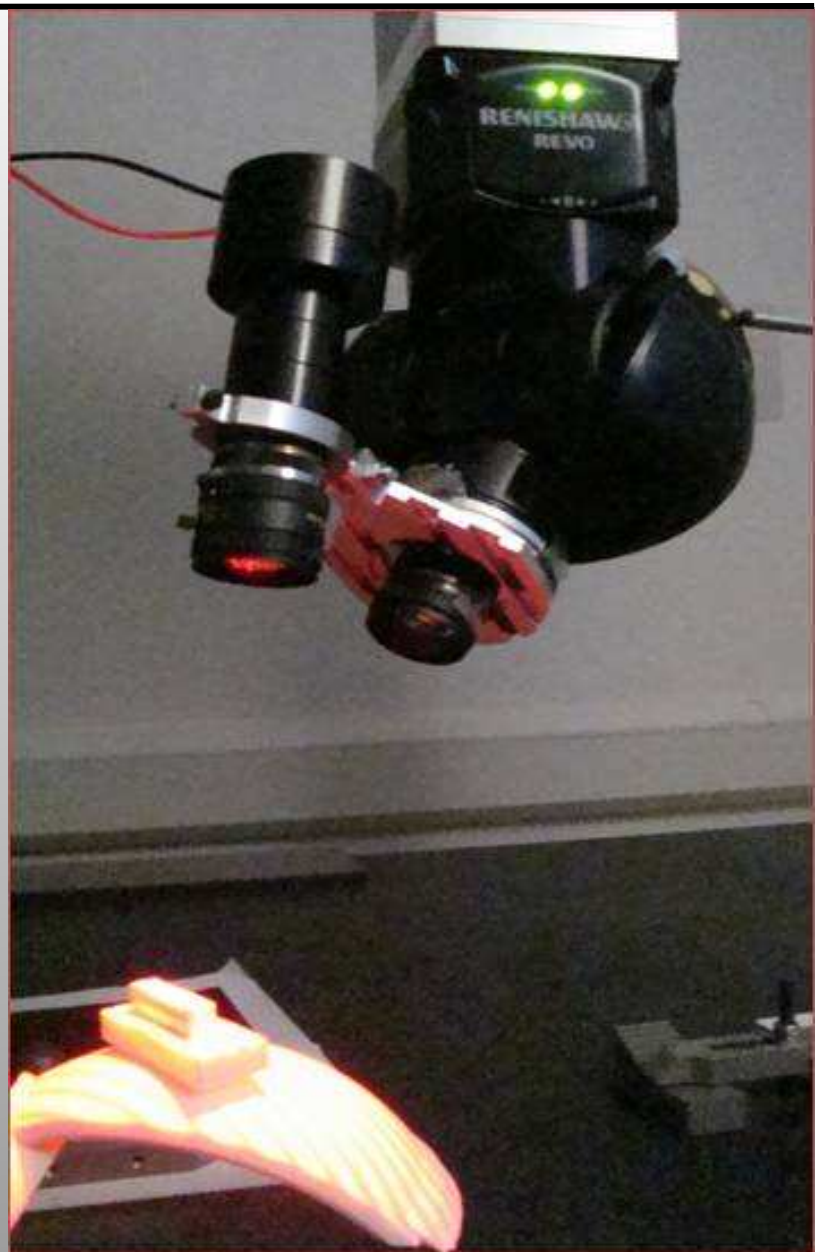
EngD - Case study

- Dr Yvonne Huddart, Renishaw plc, supervised by Prof Andrew Moore
  - Yvonne was (and still is!) an employee of Renishaw
- Project: 3-D shape measurement using optical non-contact techniques
- 4 patents published to date
- Being actively developed into new product family
- Further research carried out with EPSRC IMRC project funding



EPSRC funded CASE PhD studentship

- PhD programme sponsored by company
  - EPSRC ‘Industrial CASE’ scheme
  - CASE conversion of other EPSRC studentship (DTA)

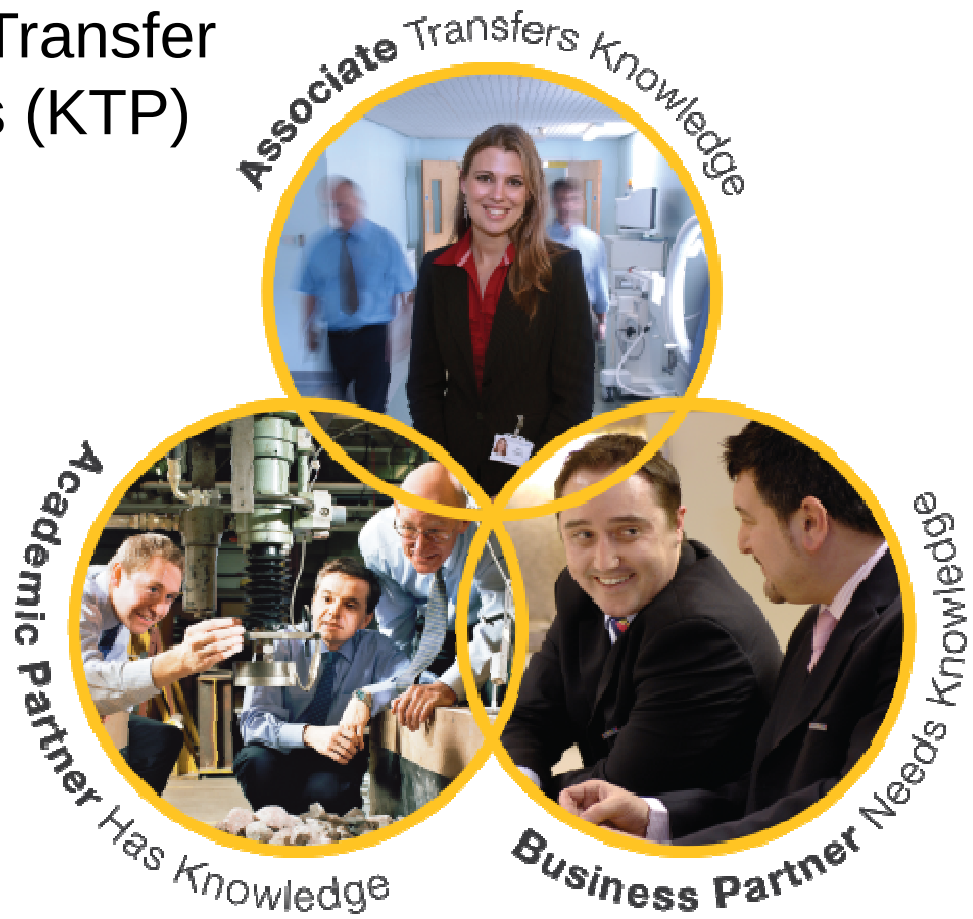
EPSRC scheme awards allocated:

- Directly to businesses using an algorithm based on financial contributions on EPSRC-funded research.
- Through Industrial CASE agents (mainly knowledge transfer networks) - a number of awards are available for businesses, especially small- and medium-sized organisations
- Students receive funding for a full EPSRC studentship for 3.5 years.
- Companies provide **additional** top up to the project of a minimum of £23k over the course of the project
- Student spends at least three months at the company, and the company pays any travel and subsistence costs

Knowledge Transfer Partnerships

Partnership Structure

Knowledge Transfer Partnerships (KTP)



Knowledge Transfer Partnerships

The Features: classic KTP

Project length 1-3 years

Associates recru

Cost: £70k per annum per KTP associate

Large company pays £35k pa; SME pays £23k pa

Employed by KB partner

Project located at business premises with business supervisor

KB Supervisor spends ~ half day per week at business premises

Knowledge Transfer Partnerships

Winner of UK KTP award for Engineering Excellence 2010

KTP case study

Caledonian Aerotech Ltd

HWU - School of Engineering and Physical Sciences / Management and Languages

Company recycles special alloys used in gas turbines & petrochemical industries

- collecting and cleaning of waste machined alloys

KTP to reduce environmental impact of cleaning process and reduce costs

- Project achieved > 10% per cent reduction in volatile organic compound (VOC) emissions

Second project to optimise existing logistics processes; develop a strategic & tactical supply-chain planning tool & develop & implement new supply-chain strategies & 'closed loop supply chain management' services.

- direct savings, inventory reduction and new business worth £2.1M

"The KTP Associate provided the company with a focus for research, development and innovation... We got clarity and projects started to happen . Getting involved with KTP had the effect of broadening our horizons and I have no doubt it will help us enter new markets" **Hugh Stewart ,** company Chairman

Summary

- Many different types of interactions
  - EPSRC research grant funding
  - EPSRC CASE PhD studentships
  - EngD
  - TSB funded collaborative research projects
  - EU framework
  - KTP
  - Directly funded research contracts
  - Consultancy
- Significant leverage of public funds possible (dependent on level of innovation / science)
- In addition to all the above, possible to carry out short feasibility studies as a first step

Spectrum of interactions