OXFORD UNIVERSITY
INNOVATION

Commercialising Research: Making Technology Work

Chim K Chu: Senior Licensing and Ventures Manager
Materials Dept Graduate Induction Day 5th Oct 2020

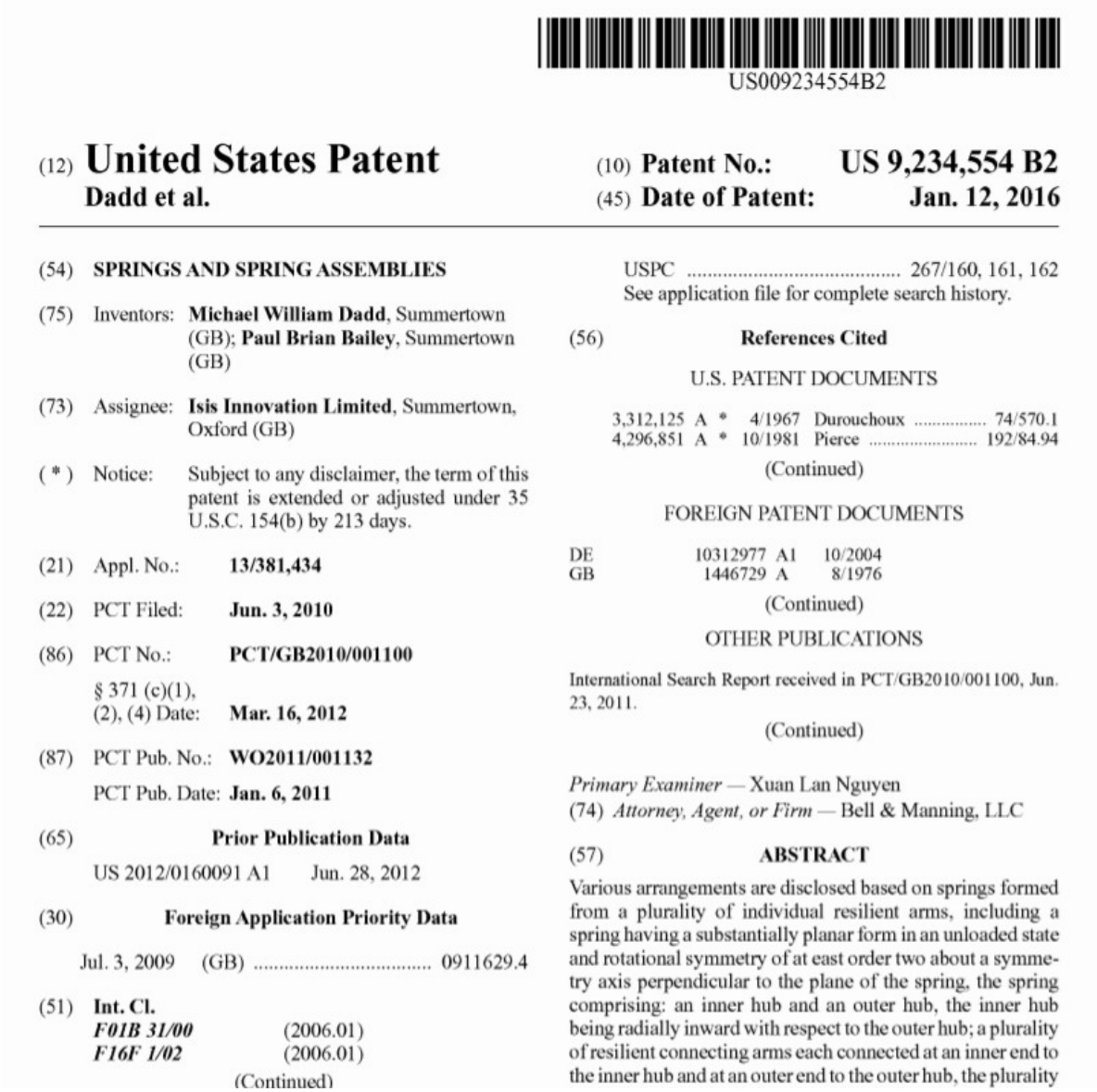
Oxford University Innovations (OUI) Who we are

- https://innovation.ox.ac.uk/about/people/chu-chim/
- **Beyond learning and teaching**: what can Oxford do for Society at large from its research outcomes?
- **OUI** is company 100% owned by the University of Oxford
- **We are Intellectual Property (IP)**
  - Protecting, developing and exploiting IP
- **We are Technology Transfer: Providing a business service to University of Oxford**
  - Handles Intellectual Property (Patents, Know-how)
  - Licences to Industry
  - Creates Spin-out companies
  - Facilitates Proof of Concept technology development

What is Intellectual Property?

- **What is IP?**
  - Published and protected: Patents, trademarks, drawings, design rights…
  - Keep as trade secrets: Know-how comprising recipes/formulae/data, process specs, test specs, models/simulations, customer lists, supplier lists…
- **Who creates IP?**
  - Research team members singularly or collectively
  - Principal Investigators and DPhil Students; many examples in Mat Dept
- **What does IP look like?**
  - An example patent as used in Space Satellite follows….
- **How useful is IP to the Developer and the End-user?**
  - Technology Readiness Level: TRL definitions follows….

Example IP: A USA Granted Patent



US009234554B2

(12) **United States Patent**
Dadd et al.

(10) **Patent No.: US 9,234,554 B2**
(45) **Date of Patent: Jan. 12, 2016**

(54) **SPRINGS AND SPRING ASSEMBLIES**

(75) Inventors: **Michael William Dadd**, Summertown (GB); **Paul Brian Bailey**, Summertown (GB)

(73) Assignee: **Isis Innovation Limited**, Summertown, Oxford (GB)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 213 days.

(21) Appl. No.: **13/381,434**

(22) PCT Filed: **Jun. 3, 2010**

(86) PCT No.: **PCT/GB2010/001100**
§ 371 (c)(1),
(2), (4) Date: **Mar. 16, 2012**

(87) PCT Pub. No.: **WO2011/001132**
PCT Pub. Date: **Jan. 6, 2011**

(65) **Prior Publication Data**

US 2012/0160091 A1 Jun. 28, 2012

(30) **Foreign Application Priority Data**

Jul. 3, 2009 (GB) 0911629.4

(51) **Int. Cl.**
F01B 31/00 (2006.01)
F16F 1/02 (2006.01)
(Continued)

USPC 267/160, 161, 162
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,312,125 A * 4/1967 Durouchoux 74/570.1
4,296,851 A * 10/1981 Pierce 192/84.94
(Continued)

FOREIGN PATENT DOCUMENTS

DE 10312977 A1 10/2004
GB 1446729 A 8/1976
(Continued)

OTHER PUBLICATIONS

International Search Report received in PCT/GB2010/001100, Jun. 23, 2011.
(Continued)

Primary Examiner — Xuan Lan Nguyen
(74) *Attorney, Agent, or Firm* — Bell & Manning, LLC

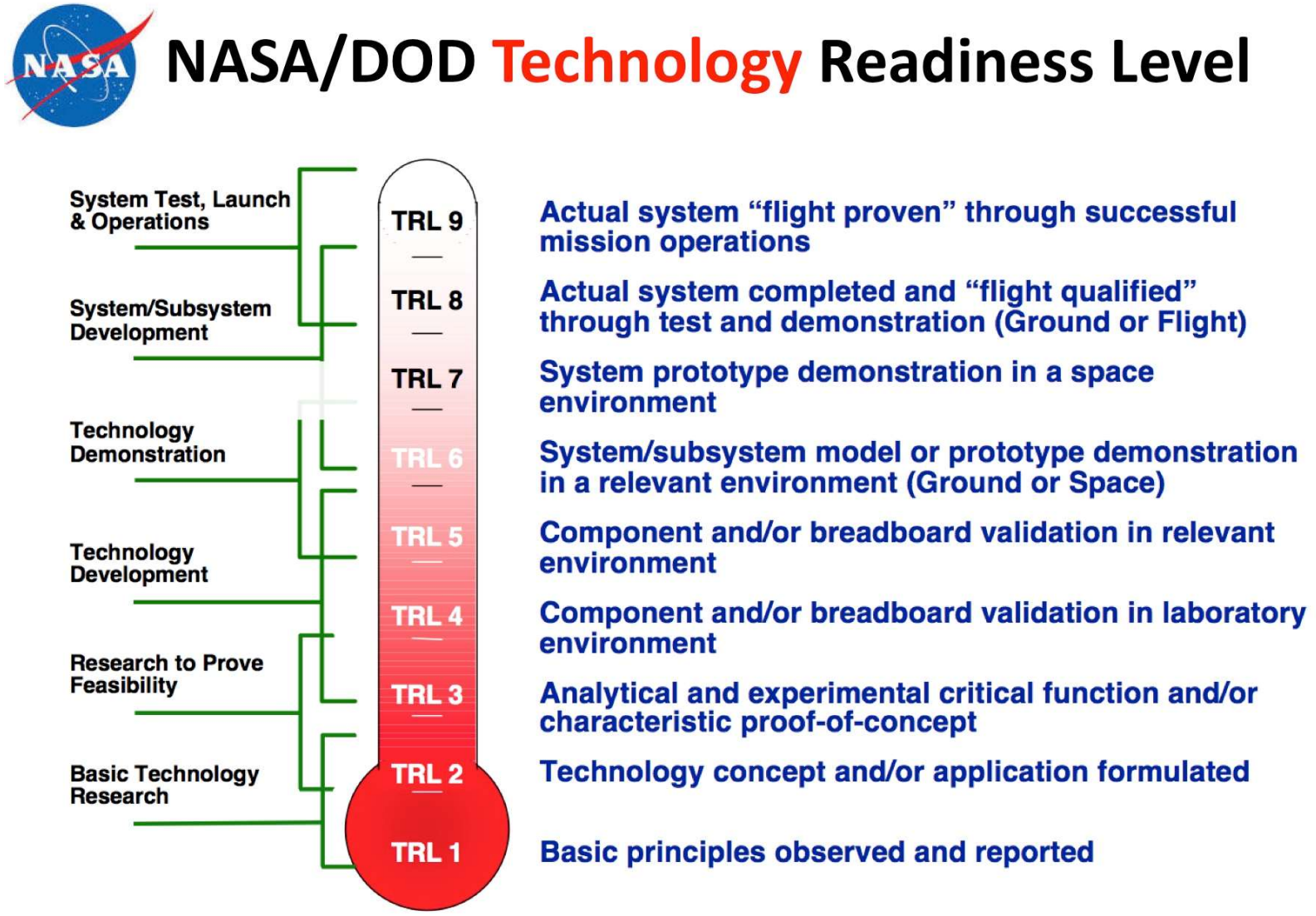
(57) **ABSTRACT**

Various arrangements are disclosed based on springs formed from a plurality of individual resilient arms, including a spring having a substantially planar form in an unloaded state and rotational symmetry of at east order two about a symmetry axis perpendicular to the plane of the spring, the spring comprising: an inner hub and an outer hub, the inner hub being radially inward with respect to the outer hub; a plurality of resilient connecting arms each connected at an inner end to the inner hub and at an outer end to the outer hub, the plurality

Oxford University Innovations (OUI) What we do

- **Exploit the IP and underpinning technology**
  - **License** the patents/know-how to a third party able/willing to exploit the IP
    - eg. Honeywell – Northrop Grumman (Cryocoolers for Space Satellite Instruments)
  - **Mature the TRL**
    - Make the IP/technology more attractive for adoption by industry: Further research to embody the IP/technology as demonstrations
    - Improve the IP/technology under a development programme as a Proof of Concept
- **Make Impact**: Make new Oxford technologies work for society
- **Add value**: Collaborating with Industry Partners
- **Business/Industry Engagement** is vital

Technology Readiness Level
Original Definition from NASA



Technology Readiness Level
How it fits into Industry

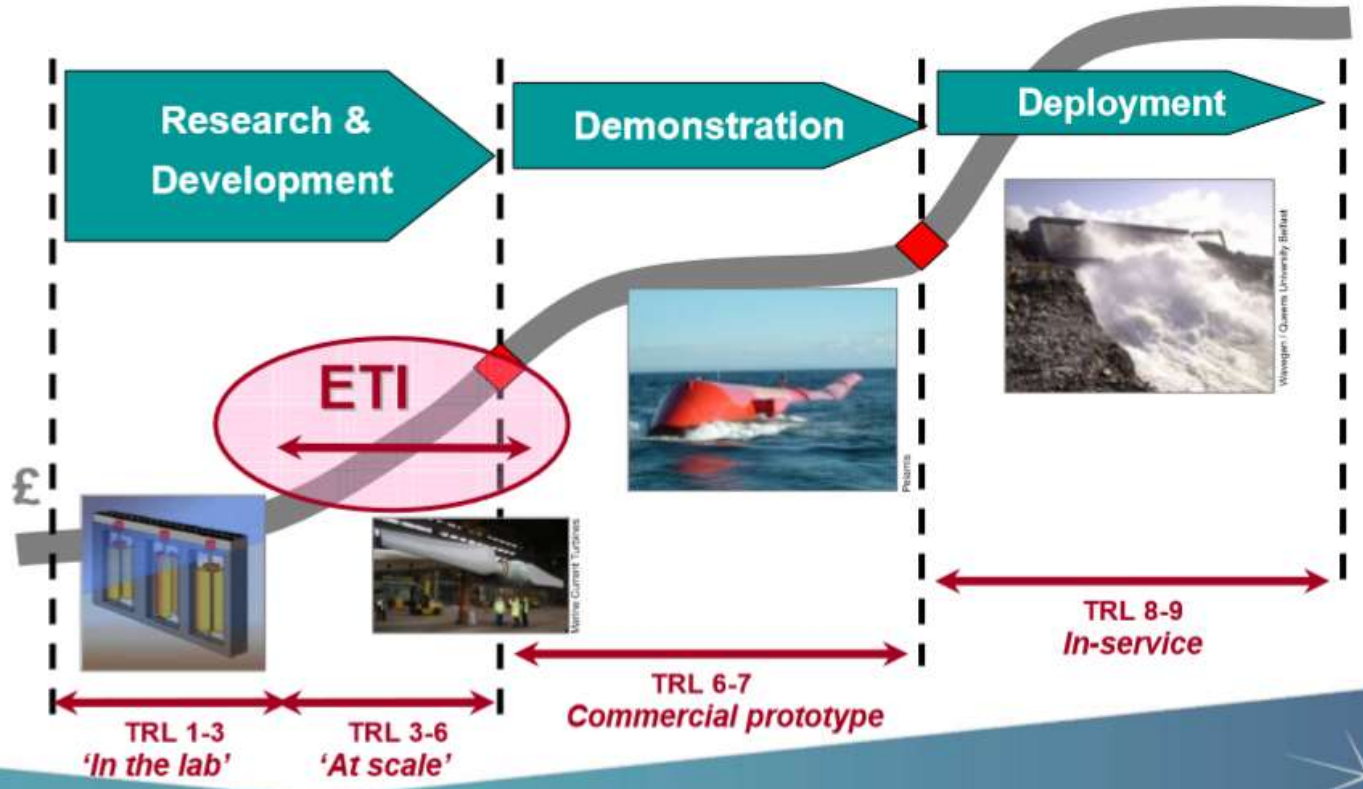
OXFORD UNIVERSITY INNOVATION

UNIVERSITY OF OXFORD

ETI is central in the Energy Innovation Chain .....

Technology push & knowledge transfer...

... market pull & public policy

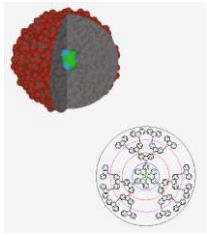


energy technologies institute

TRL = Technology Readiness Level, Images are for illustration of TRL definitions and are ETI assumed TRL status of a range of marine devices at early 2008

Examples of Intellectual Property: Chemistry Dept

- **Dendrimer Sensors: Arborescent Ltd**



IED, landmine & bomb detection

Military & contractors

Aid organisations, NGOs

- **Dendrimer/OLED Displays: Sumitomo Corp**

US007632576B2

(12) **United States Patent**
Burn et al.

(10) **Patent No.: US 7,632,576 B2**
(45) **Date of Patent: *Dec. 15, 2009**

(54) **ARYL-ARYL DENDRIMERS**

(75) Inventors: **Paul Leslie Burn**, Oxford (GB); **Ifor David Samuel**, North Haugh (GB); **Shih-Chun Lo**, Oxford (GB)

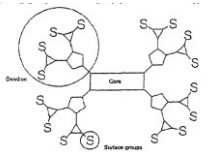
(73) Assignees: **Isis Innovation Limited**, Oxford (GB); **The University Court of the University of St. Andrews**, Fife (GB)

(58) **Field of Classification Search** 313/504, 313/506; 257/40; 428/690, 917; 546/2, 546/4; 548/101, 402
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,041,516 A 8/1991 Frechet et al.



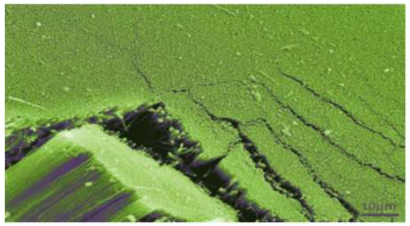
PLED display panel exhibited

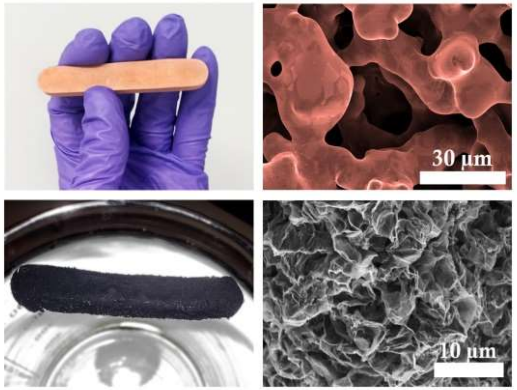
(photo by Panasonic Corp.)

© CDT 2013

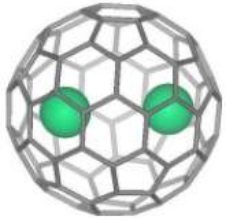
Examples of Intellectual Property: Materials Dept

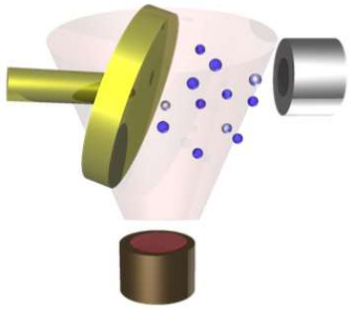
- **Graphene, Carbon Nanotubes, CVD Probe**



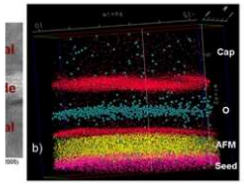


- **Buckyballs**





- **3D Atom Probe**

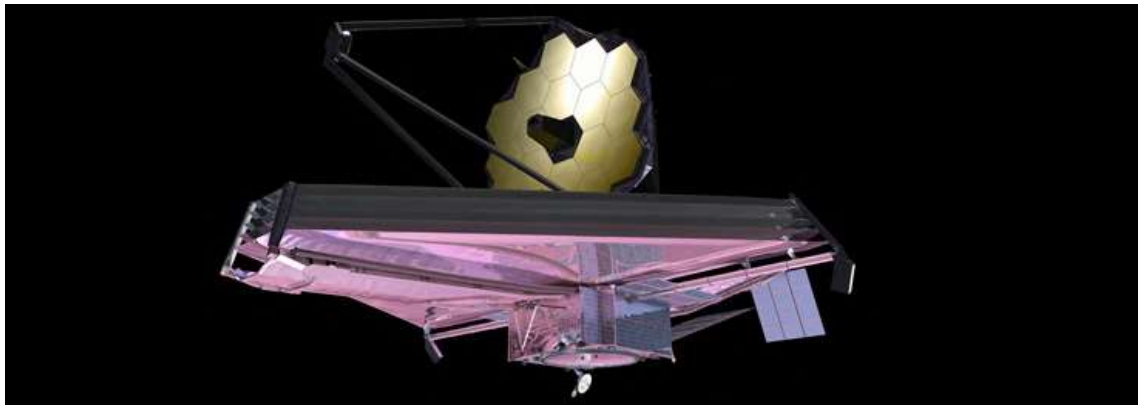


Tunneling Magnetoresistance
In disk drive read heads

Examples of Intellectual Property: Engineering Dept

- **Crycoolers for Space.** Next is a very cold 7 K cryocooler for cooling the **JW** mid-infrared detector
- **19 Satellites so far**

JW is the James Webb Space Telescope: Northrop Grumman. Launch due now in 2021, NASA's James Space Telescope - "the most powerful infrared space telescope ever built and will observe the most distant objects in the universe, provide images of the first galaxies formed, and study unexplored planets around distant stars"



THANK YOU

OXFORD UNIVERSITY INNOVATION

UNIVERSITY OF OXFORD

www.innovation.ox.ac.uk

linkedin.com/company/oxford-university-innovation

twitter.com/OxUInnovation