



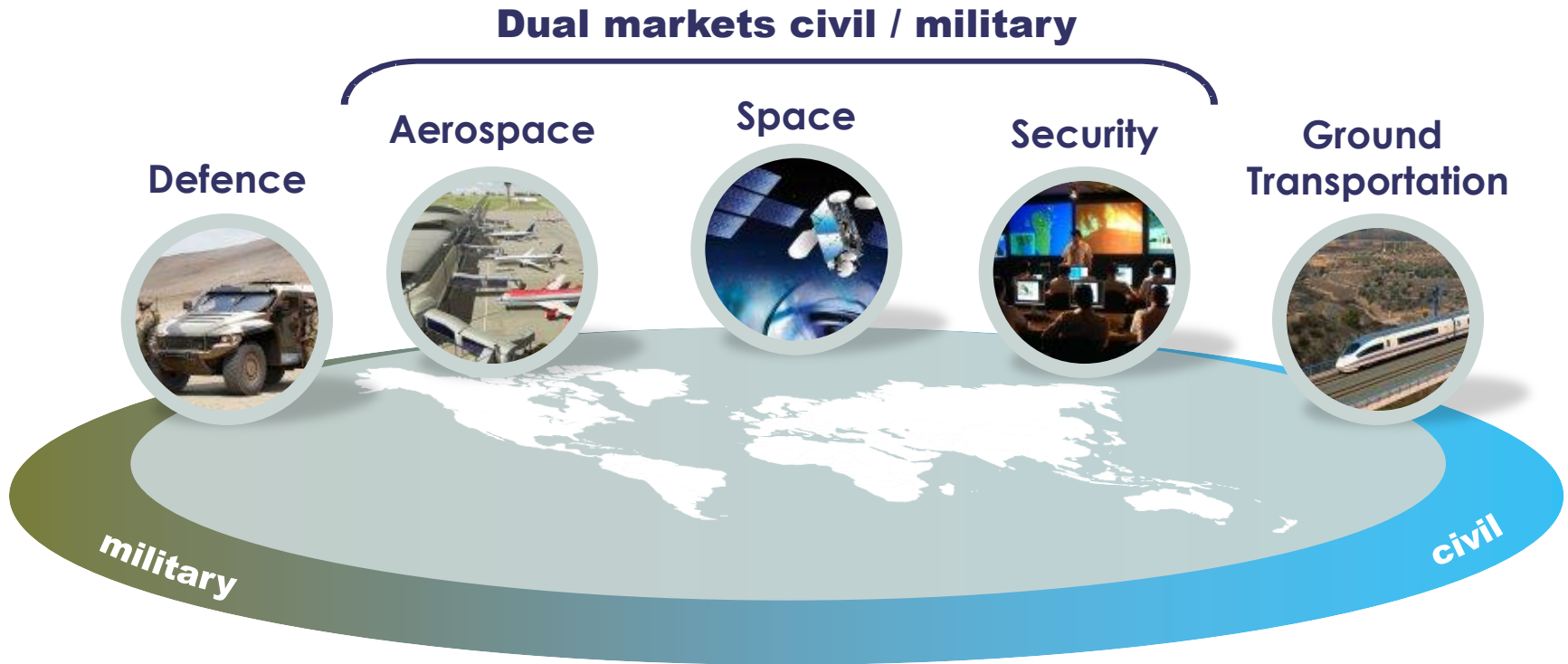
Physicists At Thales

Dr. Stephen Lee PhD CPhys
Principal Consultant Laser Engineer

THALES

- ◆ Who are Thales?
- ◆ What do Thales do in Lasers?
- ◆ An example laser physicist at Thales
 - ◆ What do I do?
 - ◆ How did I get here?
 - ◆ Where next?
- ◆ What have other physicists done at Thales?
- ◆ Conclusions

What do Thales do in lasers?



Trusted partner for a safer world

What do Thales do in lasers?

No. **1**
worldwide



**Payloads for
telecom
satellites**



**Air Traffic
Management**



Sonars



**Security for
interbank
transactions**

No. **2**
worldwide



**Rail signalling
systems**



**In-flight entertainment
and connectivity**



**Military tactical
radiocommunications**

No. **3**
worldwide



Avionics



Civil satellites



Surface radars

€14 billion in revenues

Source: Thales estimation

THALES

What do Thales do in lasers?



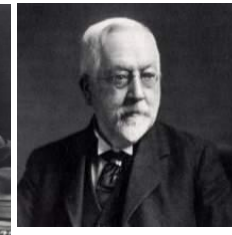
Global reach, local expertise

67,000 employees in
56 countries

THALES

What do Thales do in lasers?

- ◆ **Optronics Systems for Land, Sea & Air**
 - **Reconnaissance**
 - **Surveillance**
 - **Situational Awareness**
 - **Protection**
- ◆ **125 years heritage**



CN15 Spotting binoculars





LF1 ruby laser 1965

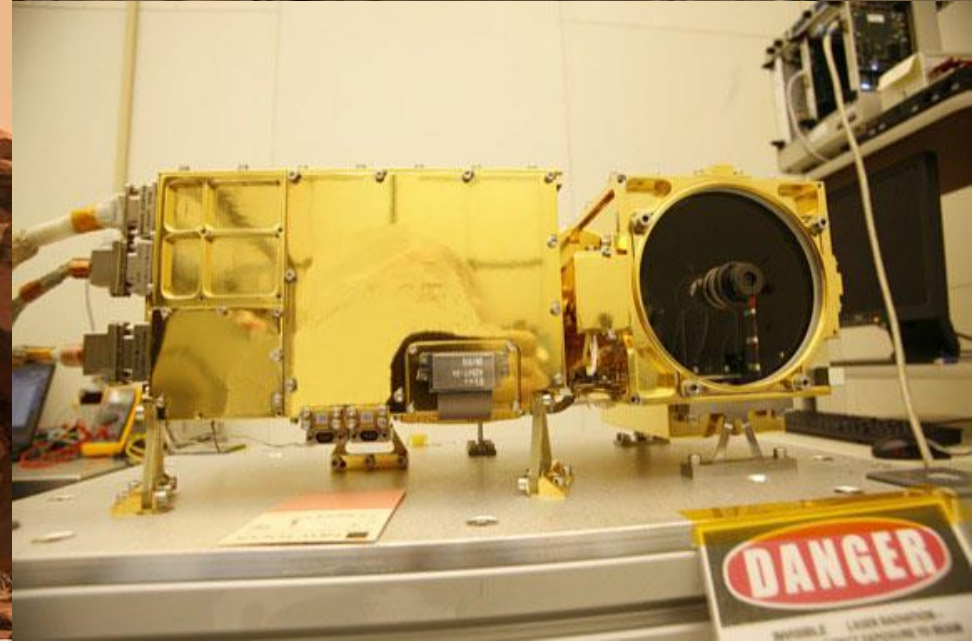
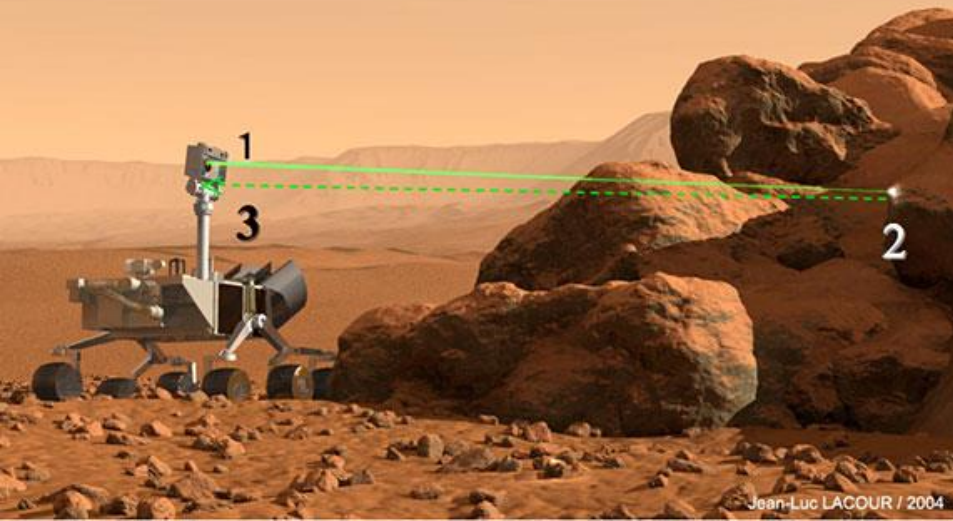
- ◆ Defence Applications
 - ◆ Laser Range Finders
 - ◆ Laser Target Designators



- ◆ Chemcam laser on NASA Curiosity Rover
- ◆ Launched Nov 2011
- ◆ Landed on Mars 6th Aug 2012
- ◆ >150,000 shots fired
- ◆ >10mJ, <5ns at 1067nm

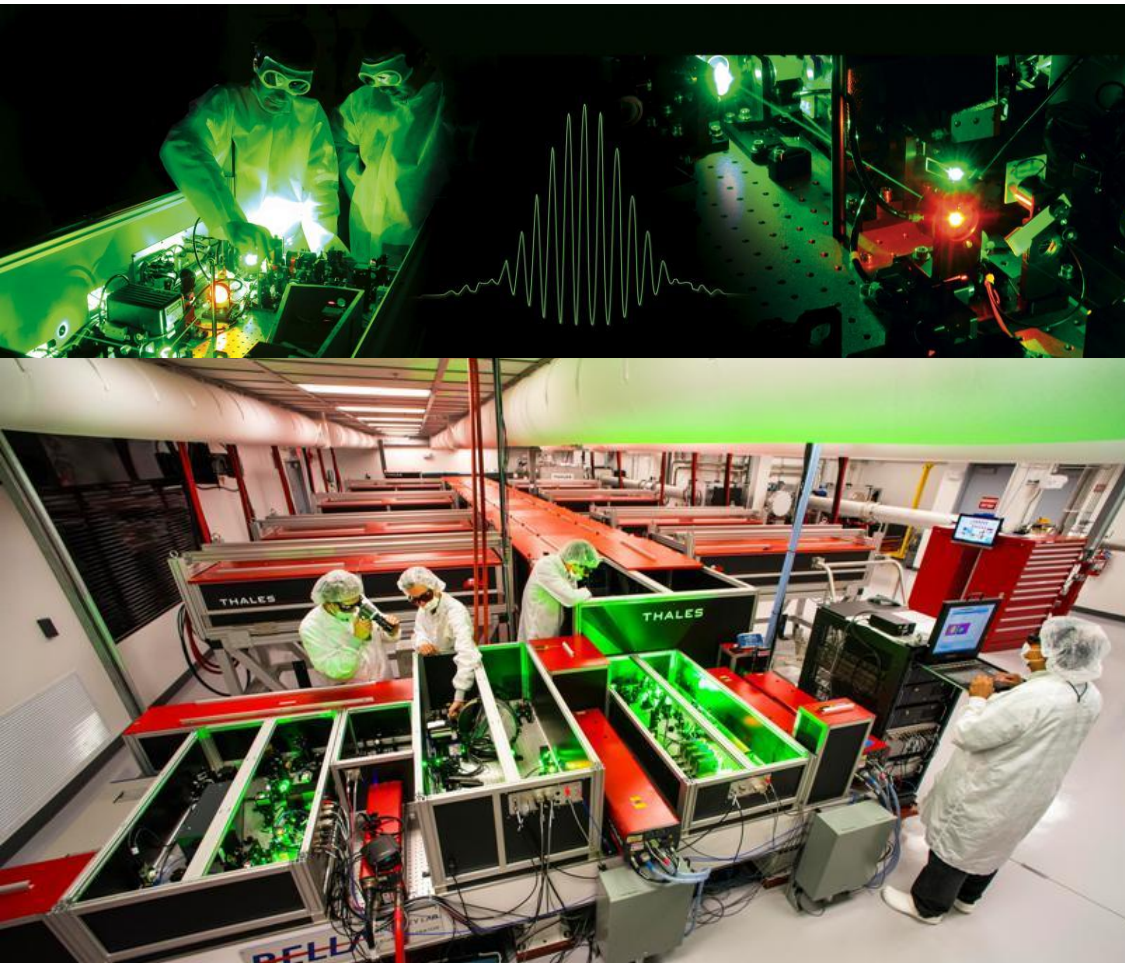


How does ChemCam work?



What do Thales do in lasers?

- ◆ Turn-key TW & PW Lasers
- ◆ Applications in particle acceleration



- ◆ BELLA: Lawrence Berkeley National Laboratory, California
 - ◆ 1PW, 40fs, 1Hz
 - ◆ Operational since 2012
 - ◆ 10GeV electrons in 1m
- ◆ ELI: Extreme Light Infrastructure in Romania
 - ◆ €60 million contract
 - ◆ 2 x 10 PW beamlines
 - ◆ Operational in 2017

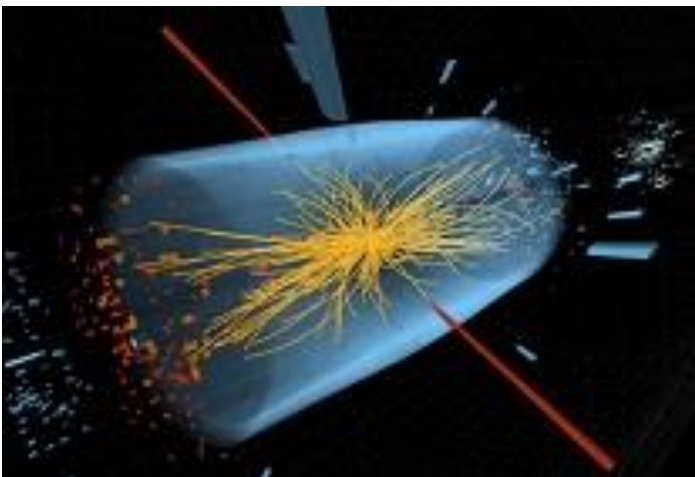
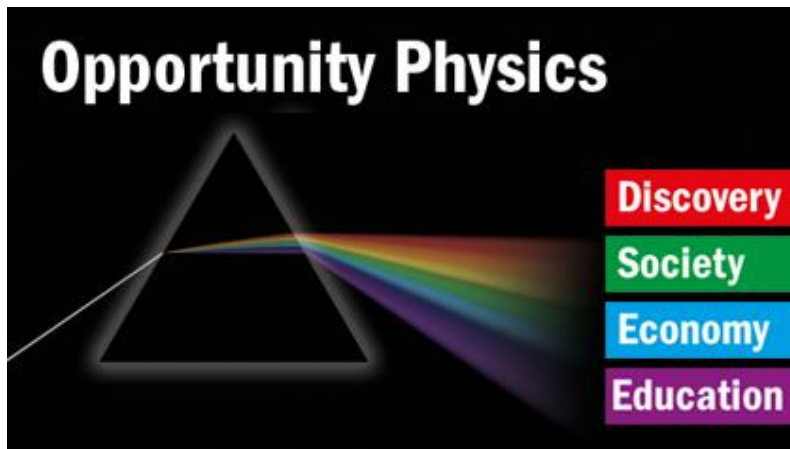
An example laser physicist at Thales: What do I do?

- ◆ Principal Consultant Engineer
- ◆ New technology development
- ◆ New product design & introduction
- ◆ Definition & supervision of doctoral student projects
- ◆ Product-Line activities
- ◆ Outreach activities

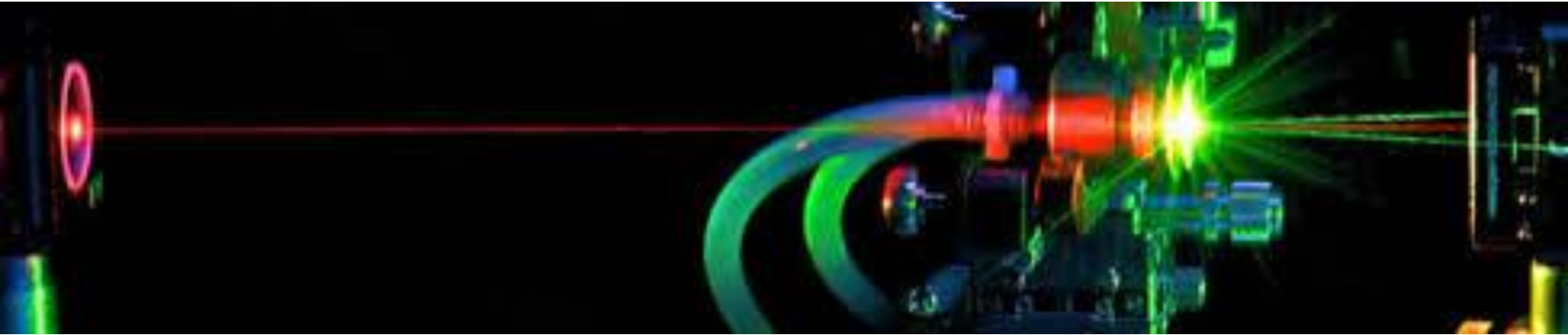
- ◆ Chartered Physicist (CPhys)
- ◆ Fellow (FInstP)
- ◆ IOP Scotland committee

CPhys

IOP
Institute of Physics



An example laser physicist at Thales: How did I get here?

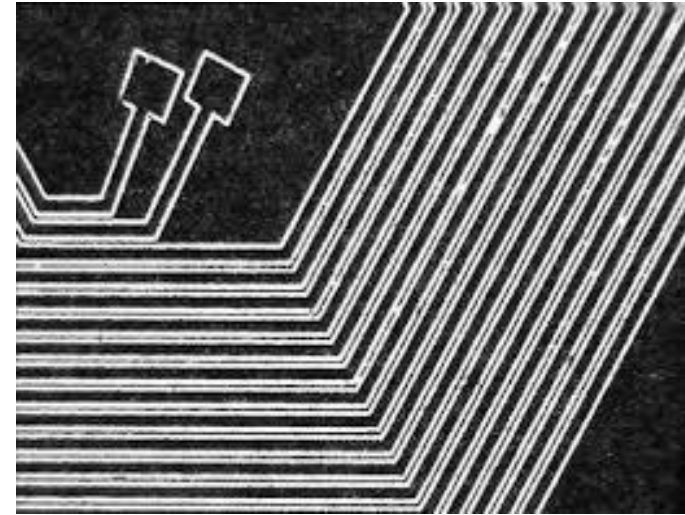
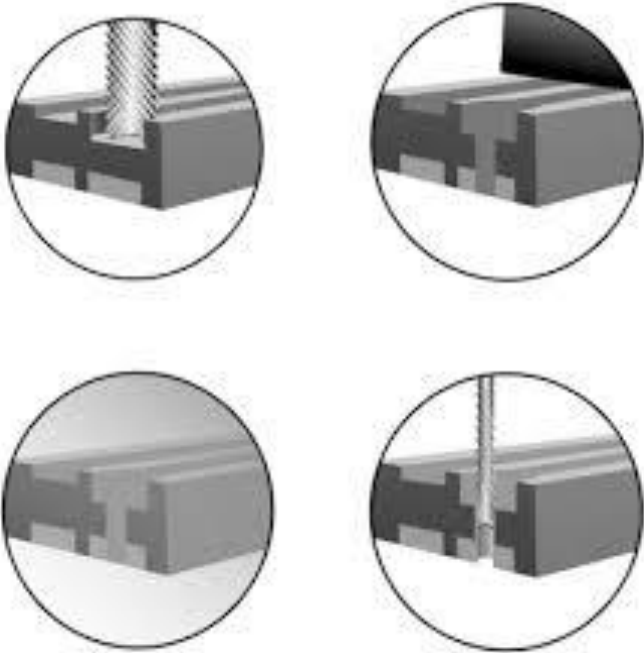


University of
Strathclyde
Glasgow

- ◆ 1992-96 BSc (Hons) Laser Physics & Optoelectronics
- ◆ 1996-99 PhD Experimental Laser Physics
- ◆ 1999-2001 Post-doctoral researcher

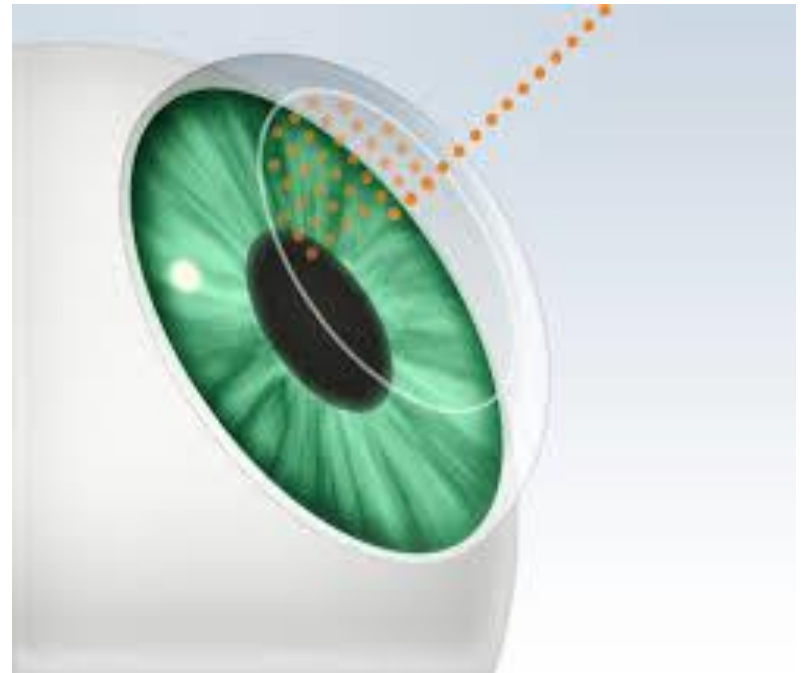
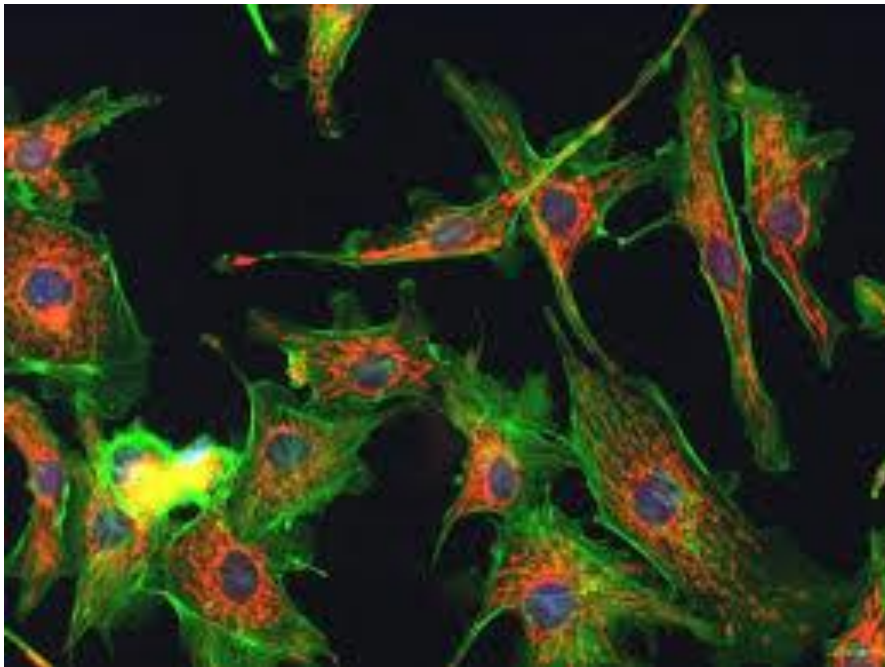
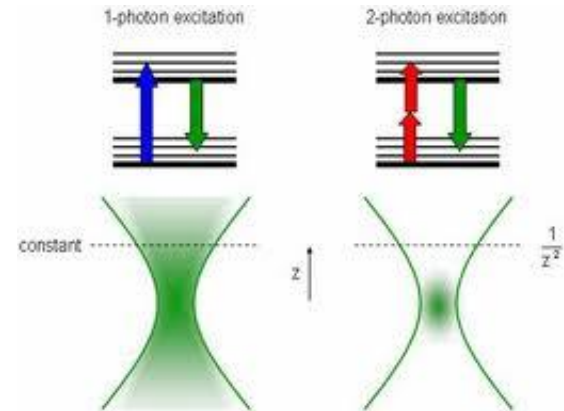
An example laser physicist at Thales: How did I get here?

- ◆ Technology Start-Up Company: Sigtronics
- ◆ 2001 Development Engineer



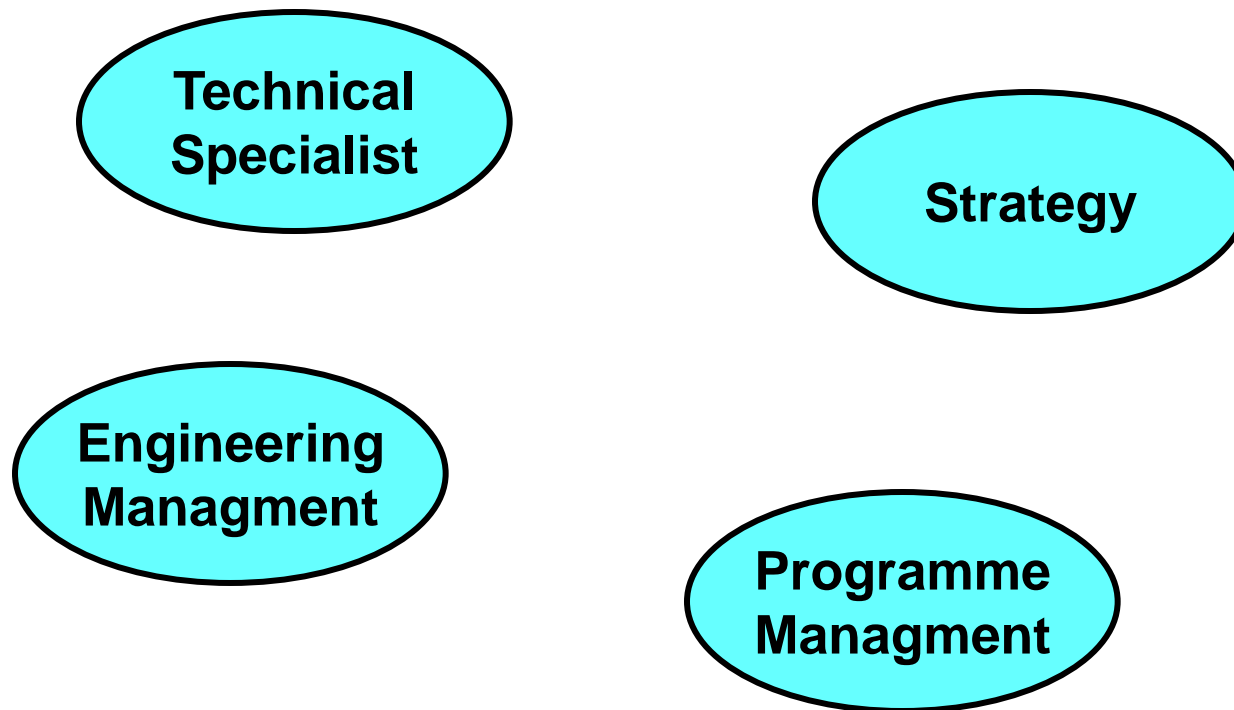
An example laser physicist at Thales: How did I get here?

- ◆ 2002-08 Senior Laser Design Engineer

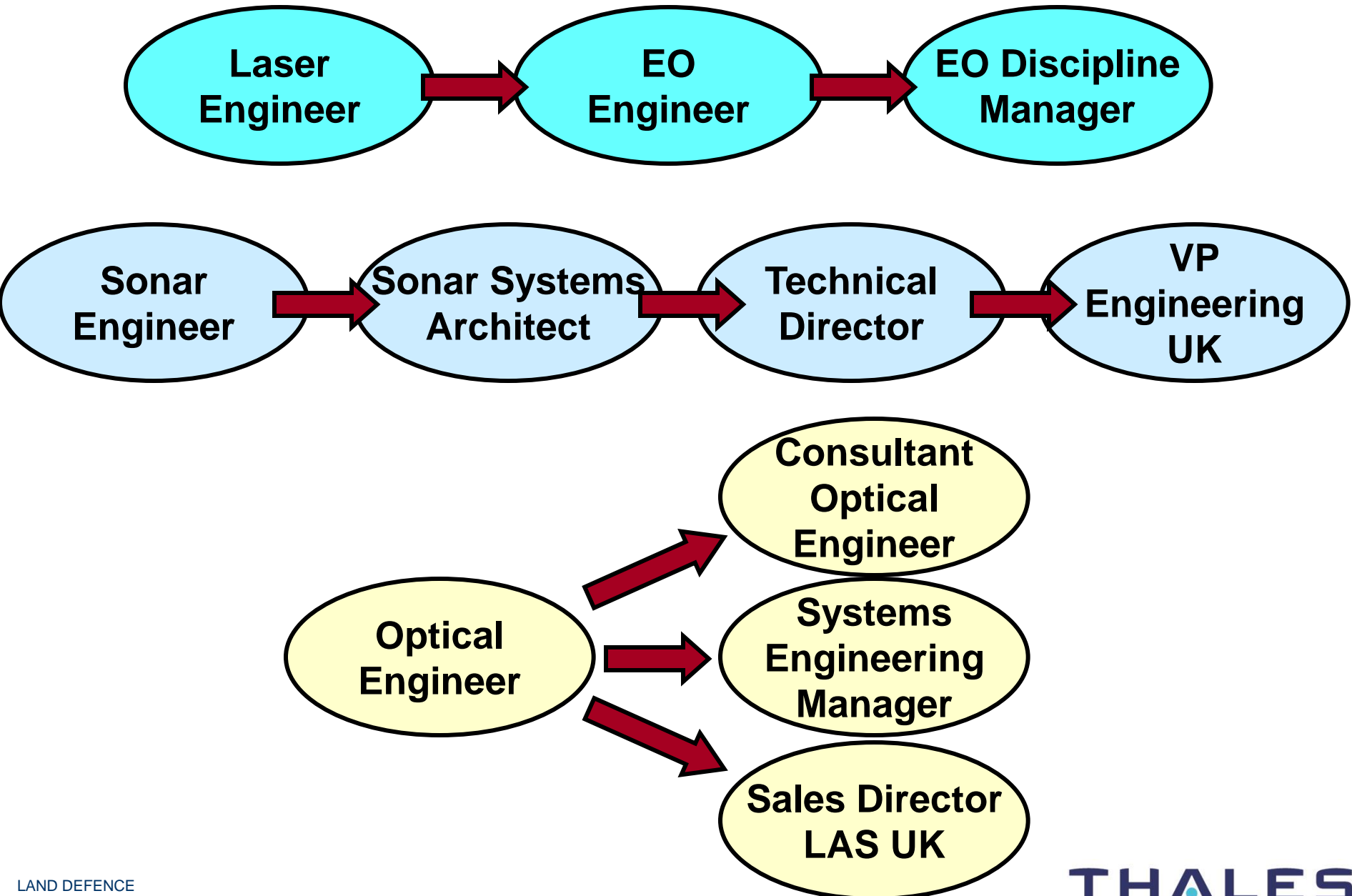


An example laser physicist at Thales: Where Next?

- ◆ 2008 - 2009 Thales, Lasers Engineering Manager
- ◆
- ◆ 2009 - Present Thales, Principal Consultant Engineer



What have others done?



- ◆ Physics & Lasers are key to Thales business
- ◆ Thales offers many opportunities for Physicists
- ◆ <https://www.thalesgroup.com/en/homepage/careers>
- ◆ Search on 13/11/14 for '**Physics**'
 - ◆ 45 open UK positions
- ◆ Search on 13/11/14 for '**Laser**'
 - ◆ 8 open UK positions
 - ◆ 32 open positions worldwide
- ◆ Contact me: stephen.lee@uk.thalesgroup.com



Are there any questions?

