

**Prof. Andrew Curtis**  
University of Edinburgh

*blogs.ed.ac.uk/curtis*  
*blogs.ed.ac.uk/imaging*

e. *Andrew.Curtis@ed.ac.uk*  
t. *0786 654 6227*

## PROFESSIONAL CAREER

- 2011-Now      **Professor of Mathematical Geoscience** (*University of Edinburgh*)  
2017-2019      **Guest Professor, ETH Zurich** (*2 years, half-time*)  
2005-2011      **Reader of Exploration Geophysics**  
*School of GeoSciences, The University of Edinburgh, Scotland*
- 1997-2005      **Senior Research Scientist then Principal Research Scientist**  
*Schlumberger Cambridge Research, England (Grade A, "Outstanding", 5 years)*
- 2000-2001      **Global Corporate Business Venturing Champion**  
*Schlumberger: Architect and Manager of global entrepreneurial venturing unit*
- 1994-1997      **Postdoctoral Research Fellow**  
*Dept. of Theoretical Geophysics, The University of Utrecht, The Netherlands.*

## ADDITIONAL APPOINTMENTS

- 2007-Now      **Active Member**, Society Exploration Geophysics (SEG) *Research Committee*
- 2017-Now      **Active Member**, European Assoc. Geosci. Eng. (EAGE) *Awards Committee*
- 2012-2019      **Active Member**, Directorate of Scottish Centre for Carbon Capture & Storage
- 2011-2013      **Head, Institute of Earth & Planetary Science (35 academics + sub-groups/PhDs)**  
*Solid-Earth section of the School of GeoSciences, University of Edinburgh*
- 2007-2011      **Founder and Director, Edinburgh Seismic Research (ESR)**  
*Then the UK's largest academic centre of Exploration Geophysics research*
- 2006-2006      **Invited Visiting Professorship**, University de Paris, Orsay, France
- 2001-2004      **Co-Founder and Leader, Schlumberger Mathematics Technical Community**  
*International Professional Society (>1500 members by 2004)*
- 2001              **Co-Founder UK Corporate Innovation & Venturing Society** (15 corporations)

## UNIVERSITY EDUCATION

- 1990-1994:      **D. Phil. in Geophysics** – University of Oxford, England  
Supervisors: Prof. P. England, FRS; Prof. J.H. Woodhouse, FRS
- 1986-1990:      **B. Sc. Honours in Mathematics (First Class)** – University of Edinburgh, Scotland

## RESEARCH BREADTH – ACADEMIC & APPLIED

*My research spans several disciplines, applications & professional societies, exploring boundaries of academic and applied science. Developing & mentoring an excellent team of scientists is vital to maintaining breadth:*

- **Prize:** Soc. Expl. Geophys. *2017 Reginald Fessenden Award (Previously Medal)*
- **Ph. D. Prizes & Awards:**
  - Dirk-Jan van Manen won *EAGE's 2007 Van Weelden Award* for best thesis, *SEG's 2008 J. Clarence Karcher Award* for best contribution to science, and was runner up in the *Royal Astronomical Society's 2008 Keith Runkorn Ph. D. Thesis Prize*
  - David Halliday won *EAGE's 2010 Van Weelden Award* for best thesis, *SEG's 2013 J. Clarence Karcher Award*, and the *Royal Astronomical Society's 2010 Keith Runkorn Ph. D. Thesis Prize*
  - Matteo Ravasi won the *Royal Astronomical Society's 2015 Keith Runkorn PhD Thesis Prize*, and Italy's *Gustavo Sclocchi PhD thesis prize 2015*
  - Robbert van Vossen & Ueli Meier both passed *Cum Laude* (Top 10% of all Dutch theses)
- **Had** 13 previous post-doctoral scientists. **Have** 2 currently. Fields include: imaging, design, risk analysis, subsurface monitoring, expert elicitation, interferometry, and non-destructive testing.
- **Had** 25 previously successful PhD students. **Have** 9 current PhD students (5 as 1<sup>st</sup> supervisor).

## MAIN RESEARCH INTERESTS

**Wavefield Interferometry & Imaging:** Head of the *Edinburgh Imaging Project*: £2M project developing novel methods and applications. Milestones incl. several foundational papers in seismic interferometry; first elastic Marchenko imaging method and first real-data application; first method to create true Born (single-scattering-only) data sets from recorded wavefields; and in 2007 WesternGeco (Schlumberger) committed their first wholesale outsourcing of commercial imaging research to my group. [45 academic papers, 3 postdocs, 12 PhD's, 7 international PhD prizes].

**Geoscientific Statistical Experimental Design:** creating novel design methods to obtain the most information from the least experimental effort/cost/instrumentation. Particularly dedicated to the design of nonlinear problems, as almost all Geophysical problems are nonlinear. Milestones include creating the first nonlinear design research/methods in Geophysics, and a legacy that has recently led to design methods being applied for full industrial seismic surveys [15 papers, 1 postdoc, 3 PhD's].

**Inverse Theory:** Published the first Geophysical Bayesian, nonlinear, probabilistic inversion using neural networks [3 PhD students, 6 papers], a method that is now established in Geophysics; created the first exact-sampling alternative to the commonly-used Markov chain Monte Carlo method for 2- or 3-dimensional gridded nonlinear inversion; created first non-sampling based method to obtain full posterior pdf's in nonlinear Geophysical problems using Hidden Markov Models [3 PhD students].

**Expert Elicitation Theory & Risk Analysis:** Combines Geology, Economics, Psychology, and uncertainty analysis in inference and design problems. Published the first papers on group interaction effects on Geoscientific expert advice and risk analysis. Recently developed the first Bayesian theory that explicitly includes the principal human expert biases, and the research questions driving inverse problems independently of any specific parameterisation: this allows human biases to be studied and quantified probabilistically in real Geoscientific problems [2 postdocs, 1 edited volume, 8 papers].

## KNOWLEDGE TRANSFER

- Code packages, reports & training released annually to academia & industry from research group
- Our research fed into WesternGeco's revolutionary Over-Under Recording technology for seismic imaging – the first outsourcing of strategic research by that company (2007-10)
- Survey design methods transferred to Total: postdoc Knowledge Transfer Partnership (2007-10)
- Ph. D. students feed research directly into industrial partners R&D through extended visits
- Many articles in international trade journals

*In Schlumberger plc.:* Created global corporate venturing unit for which \$50M was reserved.

## PRINCIPAL RESEARCH GRANTS

*At University of Edinburgh:* to-date, **£7M**. Examples:

- |   |       |
|---|-------|
| • PI, Edinburgh Interferometry Project, Multiple industrial sponsors          | £3M   |
| • Co-PI, EPSRC project on non-destructive testing (PI Mulholland)             | £630K |
| • PI, EU Innovative Training Network SPIN (€3.8M total; €505K to Edinburgh)   | £400K |
| • PI, industrially sponsored postdoc and PhD on Geological Prior Information  | £400K |
| • PI, industrially sponsored postdoc on seismic processing                    | £315K |
| • Co-PI CO <sub>2</sub> Storage project (£2.2M total; 2xPDRA's = £460K to me) | £460K |
| • PI, Knowledge Transfer Partnership, experimental design                     | £180K |
| • PI, 5 NERC Industrial/Open CASE Ph. D.'s + Industrial Costs                 | £382K |
| • PI, WesternGeco Undergraduate Scholarships                                  | £30K  |

## PATENTS & PUBLICATIONS

- >10 Patents granted
- >130 Publications in peer-reviewed, academic journals: **20 publications in 2019 or in press**

➔ ALL PUBLICATIONS LISTED AT: [www.blogs.ed.ac.uk/curtis](http://www.blogs.ed.ac.uk/curtis)