Career perspectives for people who know about atmospheric modelling

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About the lecturer

• Faculty of Science study office 1995-1999
  — Dealing with student selection, tutoring, study advisory
• International Association of Physics Students (IAPS), board member 1998-2000, 2005; ICPS organizer 1999, summer school organizer 2005
  — Organizing international events (conference+course)
• MSc 2001, PhD 2006
• ABS master programme coordinator position opened 2005 → CBACCI 2007- → ACCC 2007- → IAC2010 → CRAICC 2010-2015 → eSTIC3 2013- → ...
  +organizing several training events in EU research projects, Marie Curie, NordForsk networks
• The department noticed that this kind of coordination is needed on a continued basis → university lecturer 2010- → research director 2017-
  — MSc programme director 2016-
  — INAR deputy director 2018-
Outline

• The dilemma of higher education
• “The arrogance of a physicist”
• Learning chain
• Comfort zone
• Grand challenges
• Paradigm and learning
• Core and transferable skills
• Improving career possibilities
• Take-home points

• Based on:
  – My own observations
  – Education development and research work done at the Division of Atmospheric Sciences over the years
  – Meg Urry: Raising the Bar in Physics Graduate Education, Status – A Report on Women in Astronomy, June 2013 issue and the references within

![Diagram showing PhD in science career paths](image)
FIND AND EDUCATE YOUR SUCCESSOR
VS
SERVE THE SOCIETY

The monastery model

- The origin of modern academy is in medieval monasteries → the effect on today’s academic culture still strong!
  - “Calling” – priests/physicists are born to the profession, or not; it’s not something you can learn to want to do, or learn to do better.
  - “Dedication” – physics takes precedence over everything else; you must devote every waking hour to it.
  - “Celibacy” – god forbid you should have a personal life, like a partner or a family.
- Now this is not very modern, is it!??
Learning chain along a career

Finding the scope of personal special interest

Wondering the phenomena around us throughout our lives

Deepening the scope

Widening the scope

FLOW & COMFORT ZONE
THE FOUR-CHANNEL MODEL OF FLOW (Csikszentmihalyi, 1993)

- ANXIETY → FLOW
- APATHY → RELAXATION/BOREDOM

CHALLENGE

COMPETENCE

Boredom → Loss of motivation

Comfort zone

Work near the edge → Good motivation

Complexity → Anxiety
PARADIGM AND LEARNING

Classical vs modern paradigm

- The classical view: mathematical skills $\rightarrow$ basic theories $\rightarrow$ ”real stuff”
  + You have the tools right away
  – Can you really keep up the motivation, even for years, before getting to the interesting part?
- The modern view: phenomenological understanding of ”real stuff” $\rightarrow$ theoretical understanding $\rightarrow$ holistic understanding
  + You get immediately to play with the interesting topics
  – You’ll have to use time to learn the methods on the way
  + The importance of ”stupid questions”!
The learning is changing! (rapidly)

• Books → Internet
• Common libraries → personal libraries →
  Internet databases (clouds) and search tools
• Information explosion
• Maximal absorption of information less and less
  pronounced, skills and holistic understanding
  more pronounced
  – Necessary information available at all times
  – Realizing new connections increasingly important
• Teaching should be able to follow the
  development in learning

Core and transferable skills

• Core skills
  – Deep knowledge about the selected research topic
  – Good conduct of scientific work
  – Ability to carry out independent scientific research
  – Proof = thesis

• Transferable skills
  – Skills that can be applied on a range of fields and
    tasks, either scientific or non-scientific
  – Proof = degree certificate and supplement
Transferable skills

i. Working in the field
ii. Instrument technology
iii. Data analysis
iv. Computer modelling
v. Writing articles
vi. Presentation skills
vii. Teaching skills
viii. Project management
ix. Writing proposals
x. Commercialization of scientific ideas

Improving career possibilities (mainly for PhD students)

• Marie Curie European Training Networks and Joint Doctoral Programmes (ESR positions)
  – Good benefits, highly competed positions
• It is also possible to be involved in Marie Curie projects not being hired by the project
May be important in career

- Think if you have interest towards tasks that are not so heavily competed – it might be easier to get forward on your academic career through alternative pathways
  - Coordinating education
  - Teaching
  - Science administration
  - Proposing and organizing meetings, workshops, courses etc.
- Doing these tasks is also very educating, and provides you an easy way to build networks!

Networking

- Hang around important people, communicate with them, make your ideas clear!
  - High-level scientists, media, policymakers etc.
- Make the right networking actions in different parts of your career, start now! (if you haven’t yet)
- Network with your peers also extremely important!
  - Remember that you are not the only one advancing in your career...
Take-home points

• Be humble in front of nature but not too humble in front of other people
  – Don’t put all the eggs in one basket!
• Recognize your comfort zone and try to expand it
• Think about your core and transferable skills
  → Career planning