

# The life of a scientist: dream, build, learn, explain

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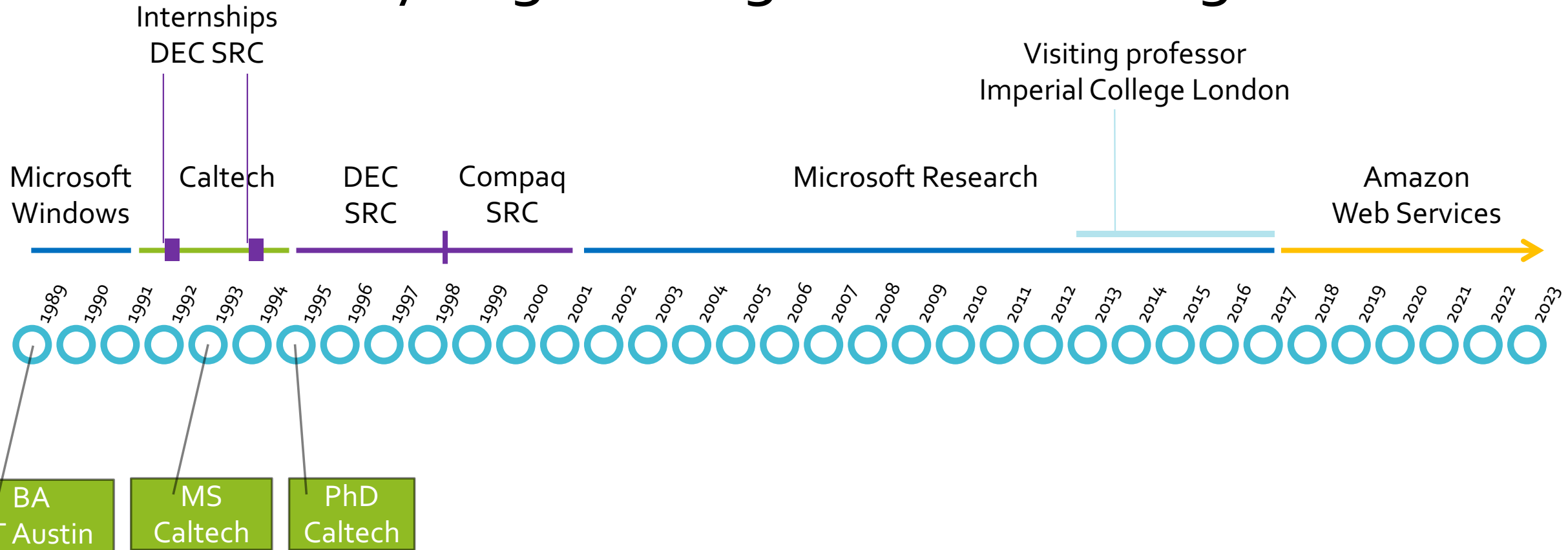
# The life of a scientist—and person

- Scientific matters
- Family
- Friends
- Extracurricular activities
- Physical health
- Emotional health
- Spiritual health
- Charity work
- Activism
- ...

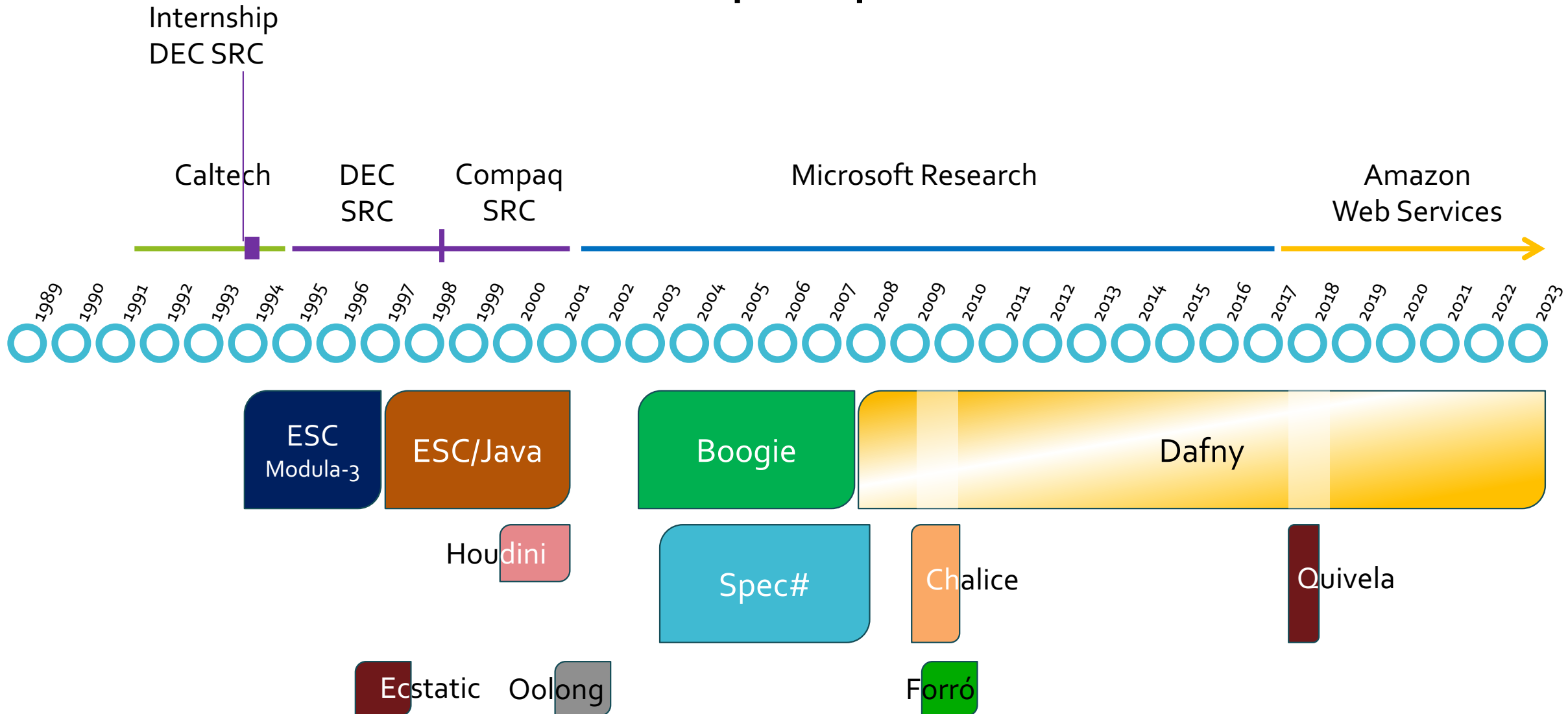
# Outline

- My background
- On the PhD
- On practicing
- On impact
- On collaboration
- On writing
- On organization
- On being yourself

# My engineering/scientific background



# ... from a tool perspective



# On the PhD

- Purpose: training for doing scientific exploration and discovery
- Imposter syndrome
- The beginning, not the end

# On practicing

- Dave Weckl

“You want to practice your technique so that when you’re playing a song and your creativity tells you to play a certain thing, then your body knows how to turn those creative thoughts into music.” \*



- Victor Wooten

“Improvisation is like saying something. So, first, you have to have something to say.” \*



\*) Paraphrase

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# On practicing

- Write
  - to sharpen your thinking
  - to convey ideas and solutions (without ambiguity)
- Simplify solutions
  - to sharpen your thinking
- Look for opportunities to explain your work
  - so you learn the questions
- Learn and understand what others do
- *Build* your vision, and try it out
  - so you find the problems
- Take breaks



# On impact

- Freedom to innovate
- Teach
- Need: funding / team / community / users
- Ideas vs long-term projects
- Career paths
  - Teacher
  - Administrator
  - Manager
  - Mentor
  - Individual contributor
  - Technical leader

# On collaboration

- Author ordering
  - Hardy & Littlewood; Leino & Müller
- Be willing to decline / not insist on co-authorship
- Acknowledgments
- Building on previous work is *good*
  - Describe what is different, if anything
  - There is power to saying “This is just like ...”
  - Be able to hold more than one thought in your head at the same time
- *Read* the papers you cite
- Diversity

# On writing

- Write often
- EWD notes, blogs
- Reduce ambitions
- Imagine your audience
  - Referees?
  - More senior colleagues in the field?
  - Peers?
  - A future person?
  - Students?
- More important than publishing in a high-prestigious conference are the research results themselves
  - Many keystone papers were not at such conferences
  - But the initial visibility is great
  - “I’m working on a POPL paper” – red flag
  - Conference-submission deadlines are great
- Hurrah for Tutorial Papers at the upcoming FM 2024!

# On organization

- Ask someone else

# On being yourself

- Be yourself
- Follow your passion, your vision
- “Do what you love” [Erika Ábrahám]
- “Do what only you can do” [Edsger W. Dijkstra]
- When you feel energy for something, act on it
- POPL 1997 referee comment: “Verification, isn’t that passé?”
- “Do not depend on the hope of results. ... As you get used to this idea, you start more and more to concentrate not on the results, but the value, the rightness, the truth of the work itself.” [Thomas Merton]
- If not results, then how do you identify the line between pioneer and waste-of-time?
  - peer reviews
  - other sounding boards (not your Mom)
  - look not just for confirmation, but also for counterevidence
  - be willing to adjust your course, don’t be too dogmatic

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- Program safely!