# A personal journey into the world of mathematics

Caucher Birkar, Cambridge University, HLF 2019

### I was born in Marivan, Kurdistan on the border of Iran and Iraq.















# When I was two the Iran-Iraq war broke out which lasted for eight years.





### We kids played with bullets, put them in fire.

My ancestors were aristocrats.

My parents were farmers.

My father took education seriously.



First time I felt a special connection with maths was when I was five.

We had a good teacher who took us out to nature and sometimes organised competition with nearby schools.





In middle school, Haidar my older brother, taught me more advanced maths, eg integration and derivation.

He taught me to learn maths for the fun of it rather than passing exams.

He was very creative.



In high school, I followed maths more seriously.

Found maths to be

- precise
- immortal
- beautiful
- source of joy
- exciting & challenging
- useful



But I was totally isolated.

Read lots of maths books from library.

Not satisfied just reading, wanted to create new maths.

Decided to become mathematician.

Dropped out of school in final year.









#### Entered University of Tehran to do undergraduate in pure maths.





Met maths professors for first time. Had access to much better library.

First year, got interested in algebraic topology.

There are two sides, one is topology, the other is algebra. They interact.

Second year, got interested in commutative algebra.



Undergraduate Texts in Mathematics M.A. Armstrong **Basic Topology** 

## Igor R. Shafarevich Basic Algebraic Geometry 1

Varieties in Projective Space

Third Edition



Third year, my graduate student room-mate spent all his time reading a book.

I was very curious and started reading it, so entered the wonderful world of algebraic geometry.

Algebra <----> Geometry



Fourth year, read Grothendieck style algebraic geometry who has been a great source of inspiration.

# Graduate Texts in Mathematics

Robin Hartshorne Algebraic Geometry

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In 2000 moved to UK and spent first year as a refugee.

In 2001 started PhD in Nottingham advised by Fesenko, a number theorist.

I was interested in algebraic geometry.





First year, attended a workshop in Newton Institute, Cambridge.

Met Shokurov, an algebraic geometer, my second advisor.

First two years couldn't prove much, wrote thesis in third year.





Finished PhD in 2004, moved to Cambridge in 2006 after a short stay at Warwick.

Spent five months in Johns Hopkins University.

Spent two months in Moscow State University and Steklov Institute.

Attended several workshops, conferences, met many people.





Finished PhD in 2004, moved to Cambridge in 2006 after a short stay at Warwick.

Life of a mathematician: research, teaching, service.

Need: motivation, concentration, patience, persistence, time management.





I believe Kurdish culture helped me a lot in life.

It is important for humanity to have diversity of cultures. Just as biodiversity is important for survival of ecosystems.



I taught my son, Zanko, to speak Kurdish.

# Thank you for your attention!