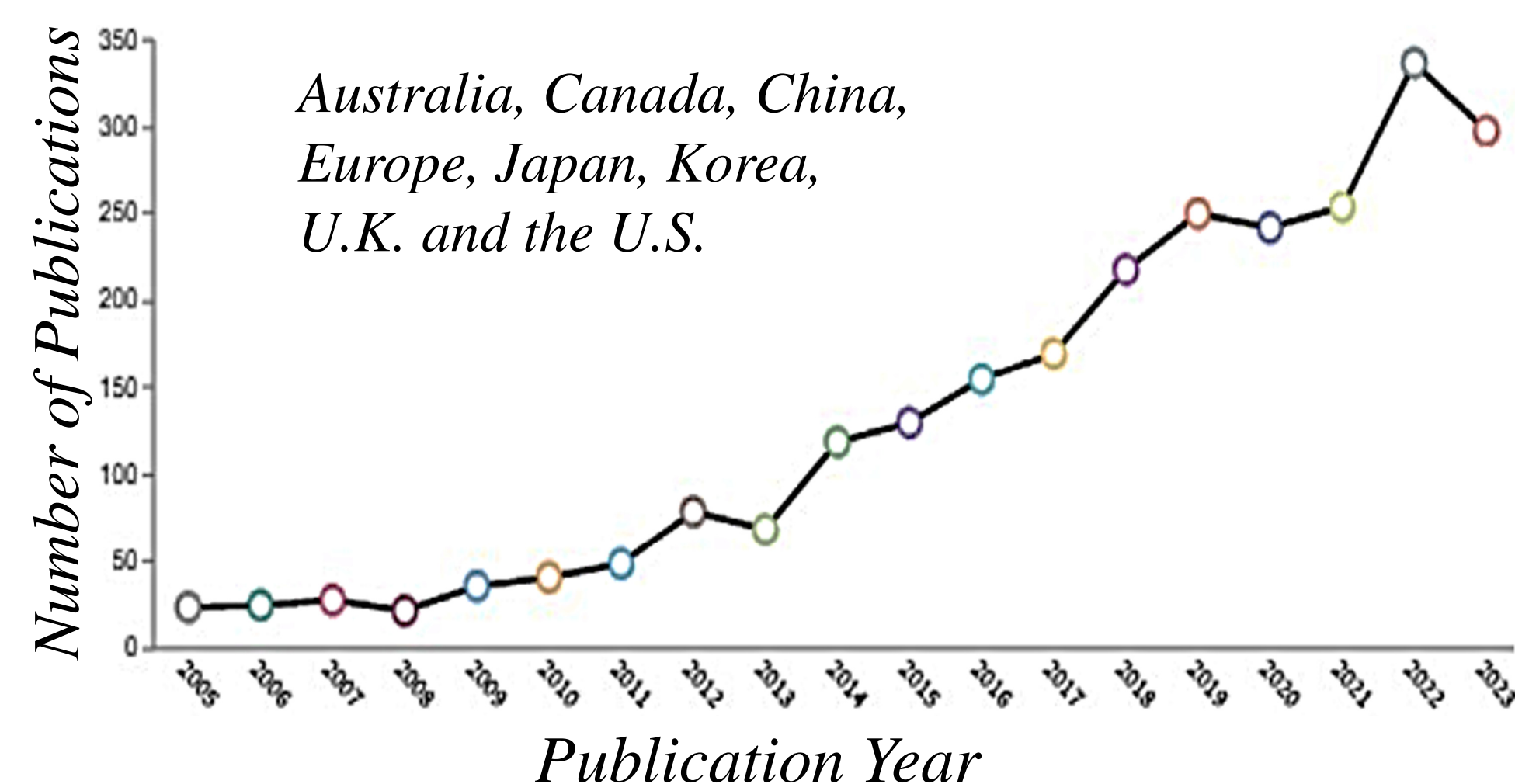


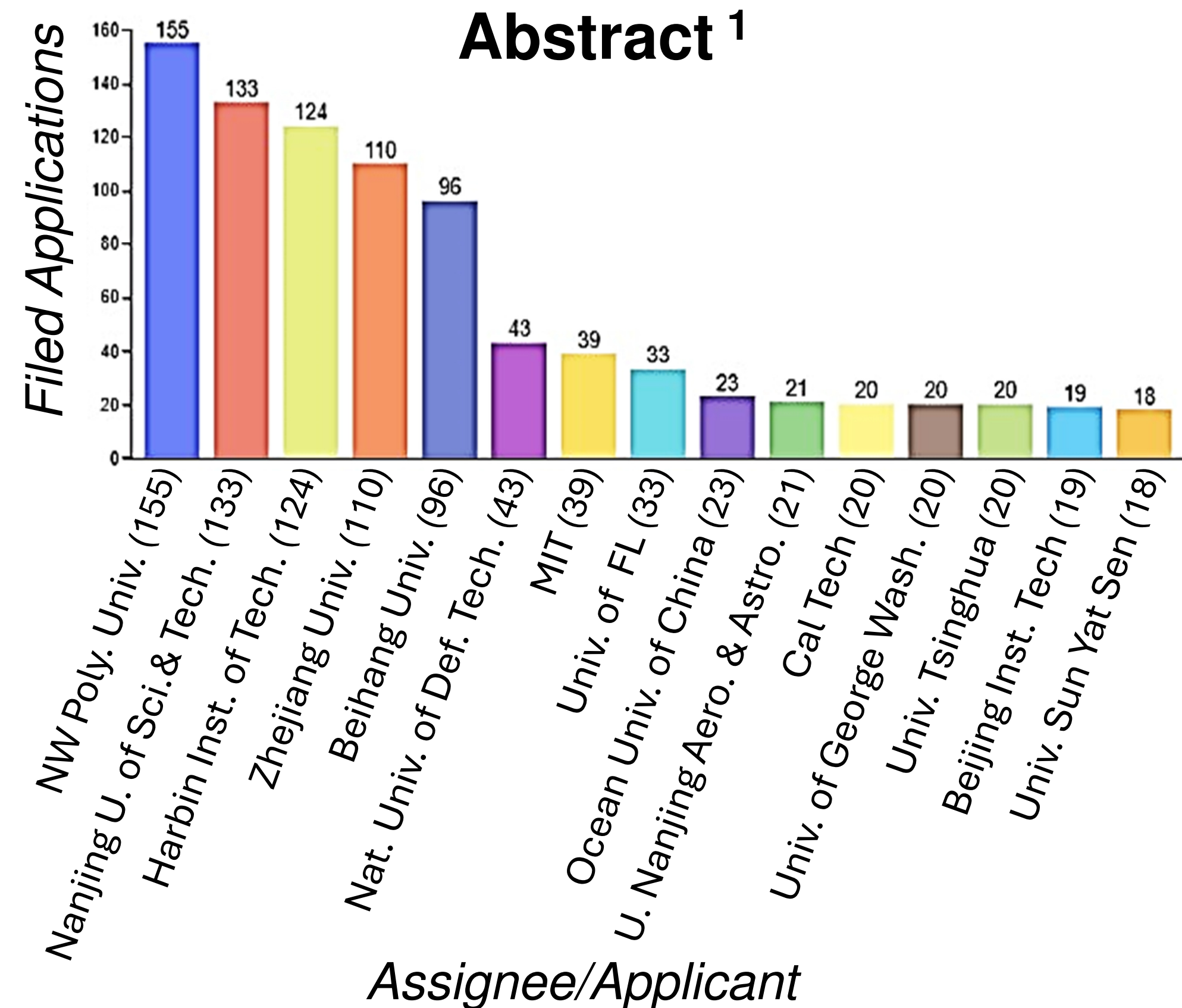
# IP and SmallSats

## Patent Application Publications with “Small Satellite” in Abstract<sup>1</sup>



- From 2013 to 2023, across the above eight countries, the number of patent applications published with the phrase **“Small Satellite”<sup>1</sup> in the abstract** increased from **about 70 to about 300**.
- From 2014 to 2024, for **space-related fields generally**, the number of worldwide patent families (inventions) **increased from about 300 to about 1200**.
- From 1991 to 2021, the **top countries of origin for space-related patent applications filed worldwide** include: the U.S. (38%), China (19%), Japan (10%), Germany (9%), France (8%) and Russia (5%).

## Academic Institutions – Patent Filings Worldwide with “Small Satellite” in Abstract<sup>1</sup>



- **Vast majority of universities** filing patent applications on SmallSats are in **China and the U.S.**
- **84% of space-related patents in Europe** are owned by **companies** (versus government or academic institutions).

<sup>1</sup> Data based on searches of publicly available patent databases (USPTO, WIPO, etc.). The search term “Small Satellite” includes “CubeSat,” “NanoSat,” “PicoSat,” “MiniatureSat,” “MiniSat,” “MicroSat,” “FemtoSat,” and variations thereof.

# Can You Build That? Analyzing the Data on the Role of Intellectual Property (IP) in Developing SmallSat and Automated Technologies

Tom Cowan and Ryan Freedman, *Knobbe Martens*

**SUMMARY:** Example data on IP related to SmallSat and automation technologies. About 38% of all patent application filings on SmallSats are in the U.S. – with about a 4X increase in U.S. filings in the last decade – followed by China (19%), Japan (10%), and Germany (9%). Universities leading in SmallSat filings are overwhelmingly in China and the U.S. The number of U.S. patent applications filed on “AI” and “SmallSats” roughly tripled from about 2013-2023. Patents and other IP rights are double-edged swords for technology companies, both providing the right to prevent unauthorized use of your innovations while imposing responsibilities to avoid such rights of third parties.

## IP Law Basics

- Intellectual Property (IP) is a set of legal rights and responsibilities related to innovative ideas, and it covers the areas of patents, trade secrets, copyrights, and trademarks.
- **Patents (utility)**
  - Protects **new and inventive functional ideas** (e.g., satellite structure/deployable designs, GNC algorithms, communication systems, material compositions, etc.).
  - Provides **the right to exclude others from practicing the invention**.
  - Lasts **20 years**.

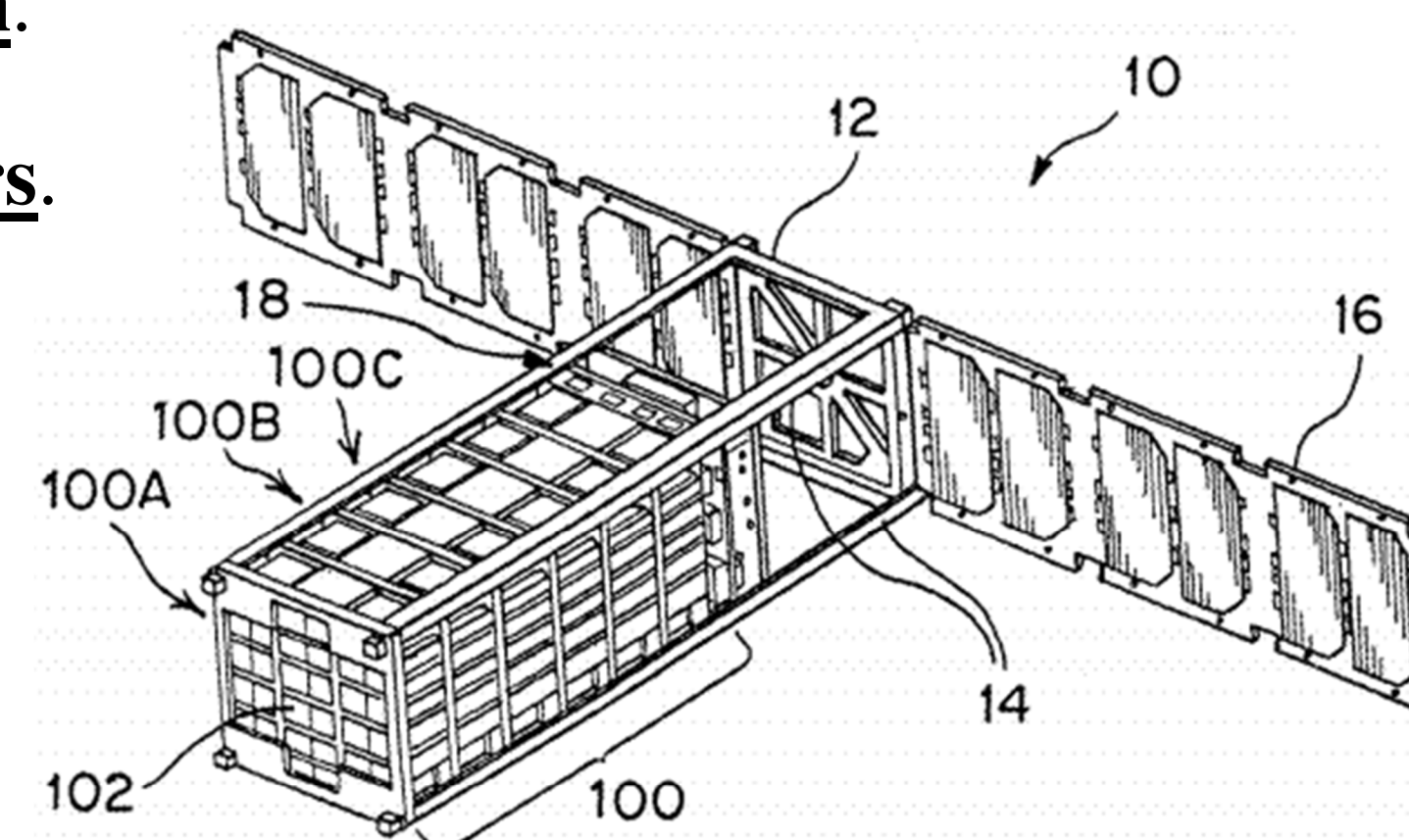


FIG. 1A

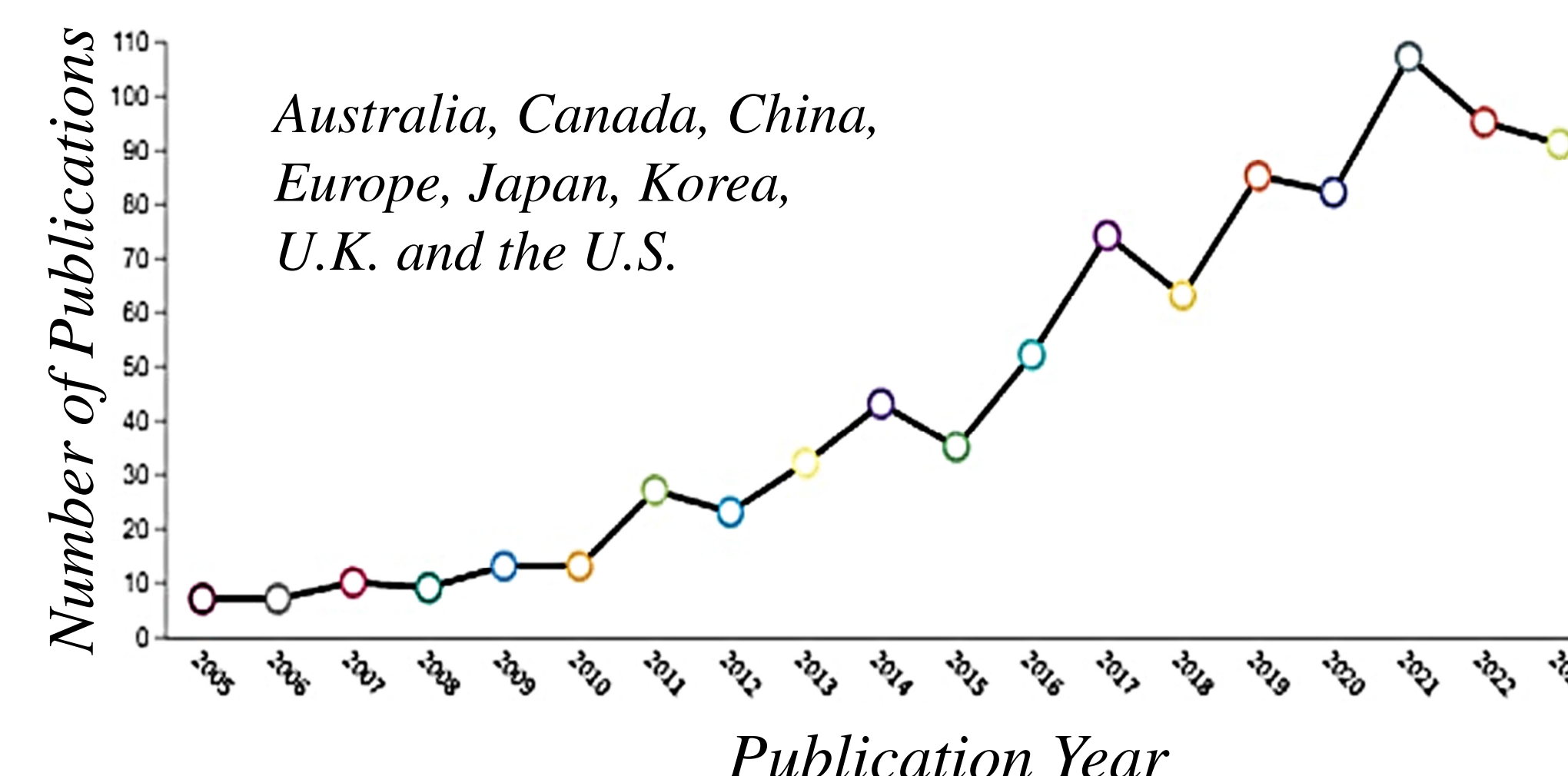
- **Trade Secrets**
  - Protects information that derives **value from not being generally known** (e.g., attitude control algorithm, manufacturing/assembly methods, customer data, etc.).
  - Must take **reasonable efforts to maintain its secrecy** (e.g. use NDA’s, passwords, confidentiality, etc.).
  - Provides the **right to recover damages for theft**.
- **Trademarks**
  - Protects **words or logos associated with the source** of a product (e.g., **BLUE ORIGIN**, **LOCKHEED MARTIN**, etc.).
  - Provides the right to prevent others from using **confusingly similar marks**.
- **Copyrights**
  - Protects original **expression of an idea in a fixed medium** (e.g. software code, website design, etc.).

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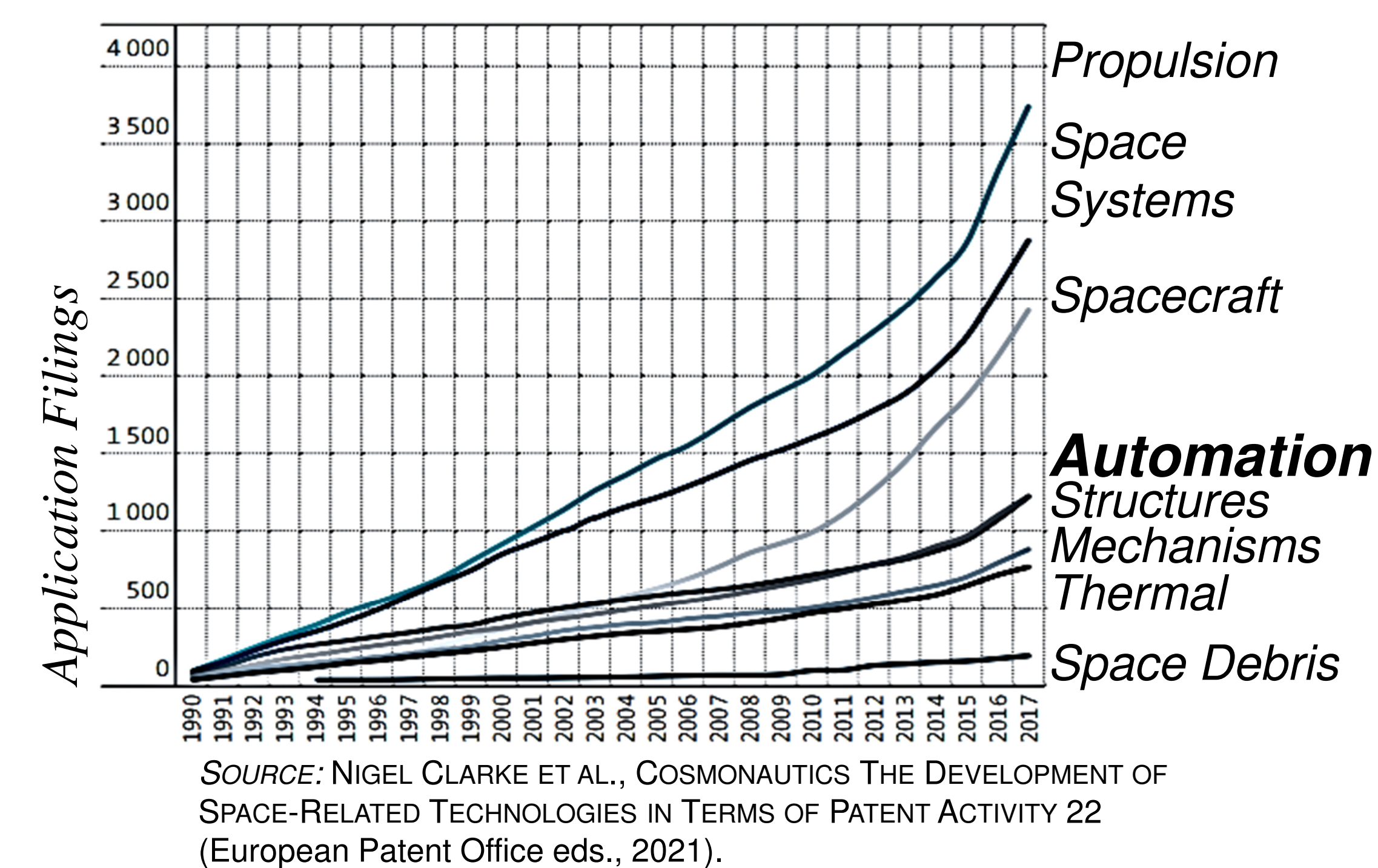
# IP and Automation

## Patent Application Publications with “Small Satellite”<sup>1</sup> and “AI” in Abstract<sup>2</sup>



- From 2013-2023, across the above eight countries, the number of published patent applications with **“Small Satellite”<sup>1</sup> and “AI”<sup>2</sup>** in the abstract **roughly tripled**.

## Space-Related Patent Applications Filed in Automation<sup>2</sup> vs. other Technologies Worldwide (1990-2017)



- As of 2017, **“automation” in space tech** had more applications filed than structures, mechanisms, thermal and debris technologies.
- From 2015 to 2017, worldwide **space-related patent filings relating to automation increased by about 33%**.
- Within space tech, most patenting of automated technologies is active in: **exploration, orbital systems, manipulation systems and mobility systems**.

<sup>2</sup> Data based on searches of publicly available patent databases (USPTO, WIPO, etc.). “AI” and “automation” includes “artificial intelligence,” “machine learning,” “ML,” “automated,” “autonomous,” and variations thereof.