

The String Family

The week of August 1-5, 2022, **Niels Bohr International Academy** will host a follow-up scientific meeting to the Bohr-100 public events. The meeting will take place in the historic Auditorium A of the Niels Bohr Institute and, in keeping with the 100-year old tradition, there will be no fixed scientific topic.

The idea is to provide a stimulating environment with few talks per day, but plenty of time for informal discussions. A broad range of topics will be addressed.

Overview [\[edit \]](#)

The Institute was founded in 1921, as the Institute for Theoretical Physics of the University of Copenhagen, by the Danish theoretical physicist [Niels Bohr](#), who had been on the staff of the University of Copenhagen since 1914, and who had been lobbying for its creation since his appointment as professor in 1916. On the 80th anniversary of Niels Bohr's birth – October 7, 1965 – the Institute officially became the Niels Bohr Institute.^[1] Much of its original funding came from the charitable foundation of the [Carlsberg](#) brewery, and later from the [Rockefeller Foundation](#).^[2]



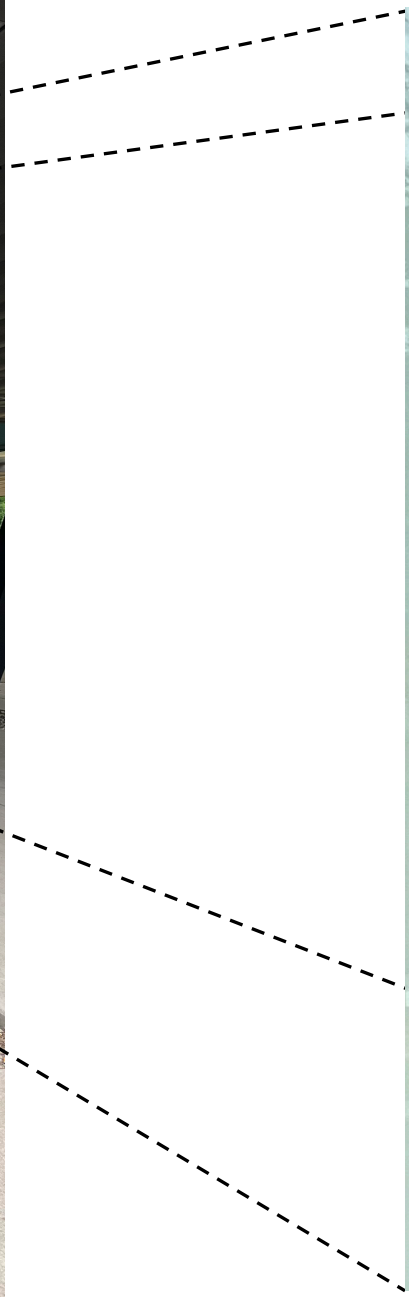
PI PERIMETER INSTITUTE

Practically every technology we use today – from computers to smartphones to lifesaving medical devices – emerged from breakthroughs in fundamental, curiosity-driven physics.

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Their discoveries will make possible the next wave of transformative technologies and further humanity in ways we have only begun to imagine.

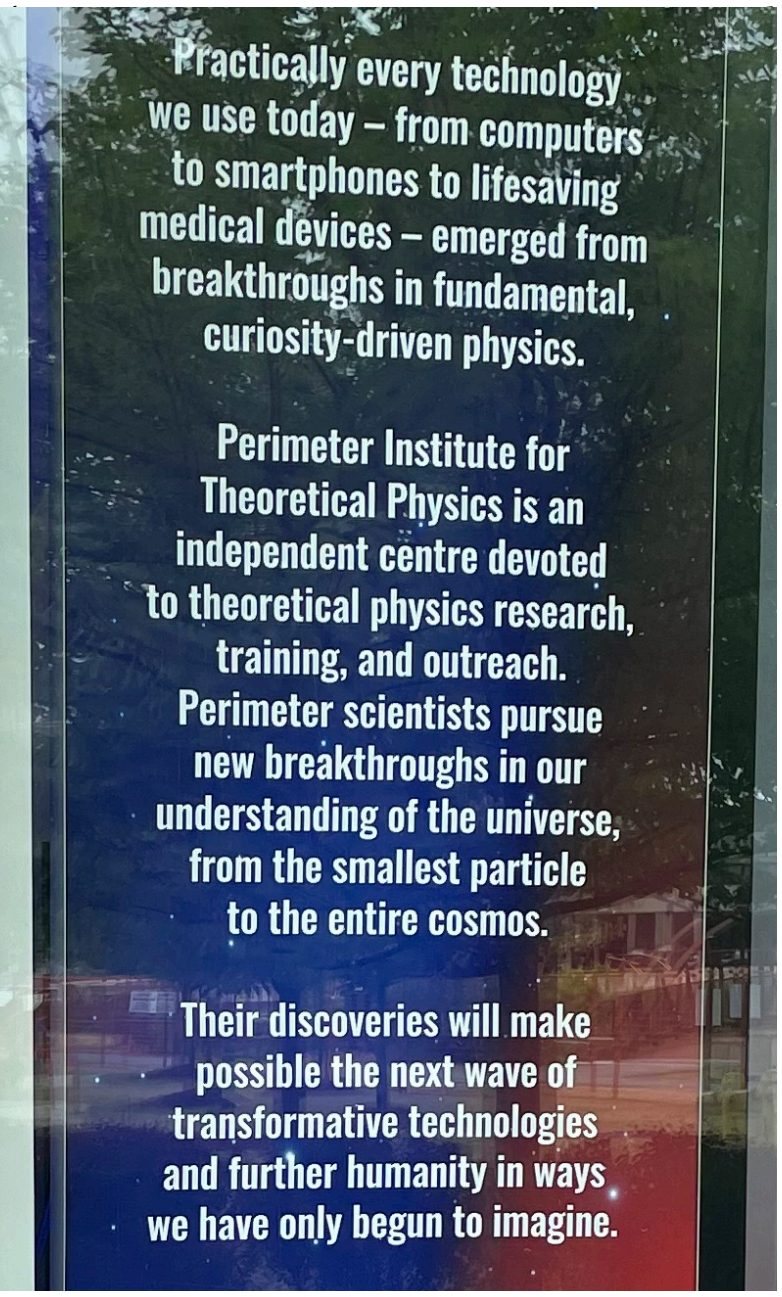
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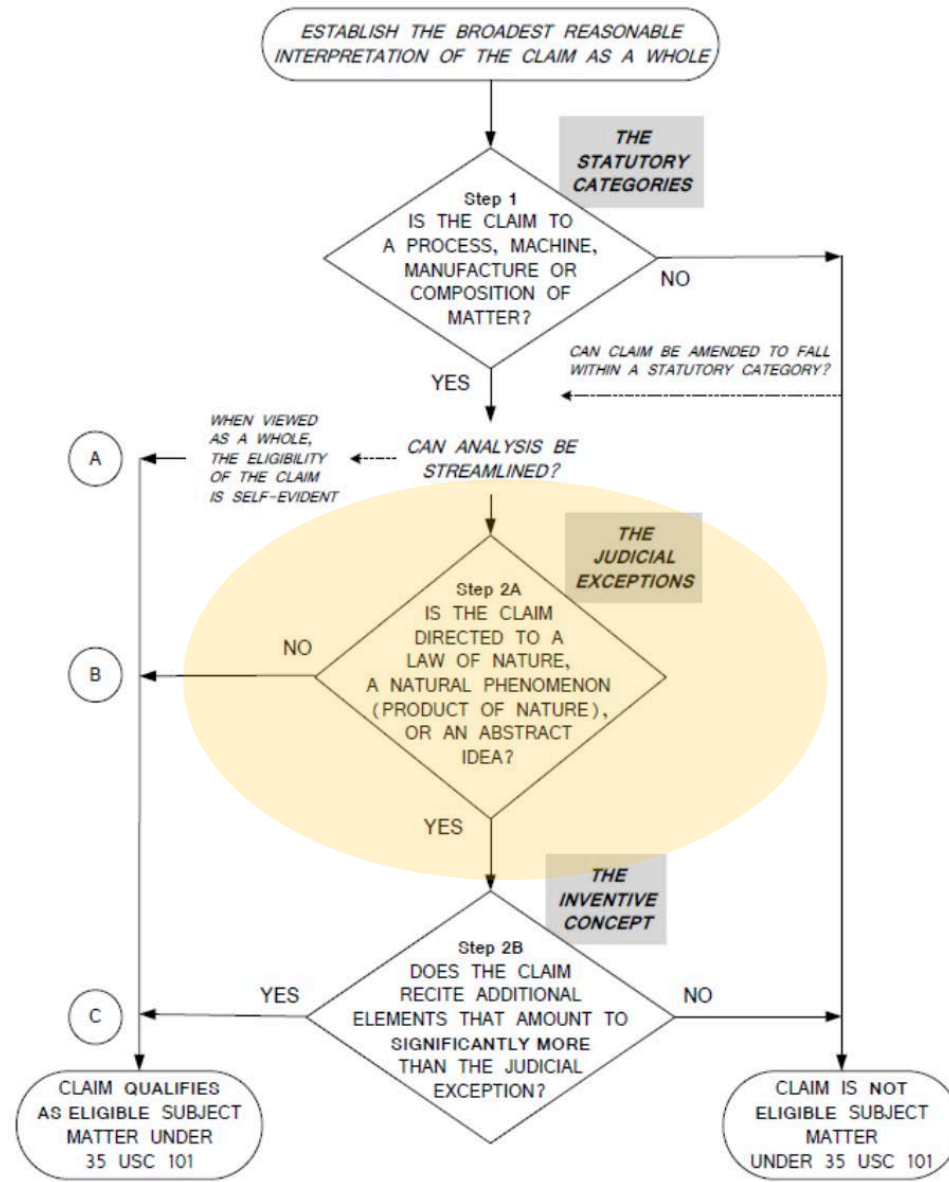
Why haven't we already *earned*
the money it would take to
endow us going forward?

Practically every technology
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to smartphones to lifesaving
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curiosity-driven physics.

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SUBJECT MATTER ELIGIBILITY TEST FOR PRODUCTS AND PROCESSES



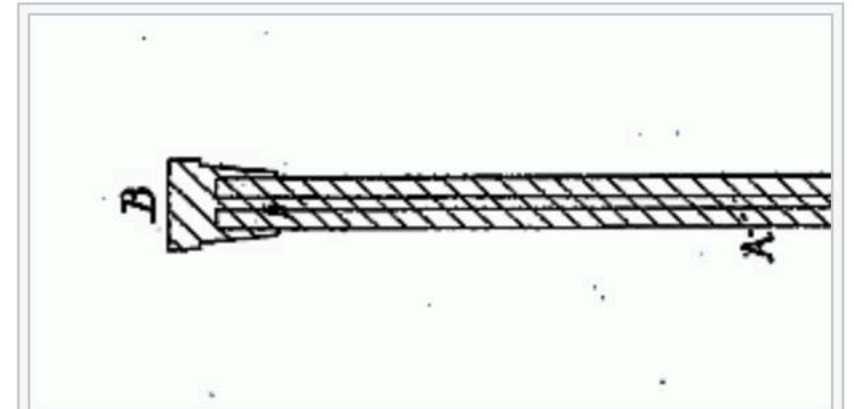
(A) (B) (C) → THE PATHWAYS TO ELIGIBILITY

Rubber-Tip Pencil Co. v. Howard

From Wikipedia, the free encyclopedia

Rubber-Tip Pencil Co. v. Howard, 87 U.S. (20 Wall.) 498 (1874), is an 1874 decision of the United States Supreme Court concerning the patent eligibility of abstract ideas.^[1] As explained below in the *Subsequent developments* section, it is intermediate in the development of that aspect of patent law from *Neilson v Harford*,^[2] through *O'Reilly v. Morse*,^[3] to *Funk Bros. Seed Co. v. Kalo Inoculant Co.*,^[4] and then to *Parker v. Flook*,^[5] *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*,^[6] and *Alice Corp. v. CLS Bank Int'l.*^[7]

The *Rubber-Tip Pencil* case has frequently been cited in the subsequent Supreme Court decisions concerning the patent eligibility of computer-related claimed inventions, such as *Alice Corp. v. CLS Bank*,^[8] *Diamond v. Diehr*,^[9] *Parker v. Flook*,^[10] and *Gottschalk v. Benson*,^[11]



Cross-sectional drawing of rubber-tip pencil in patent on that product – U.S. Pat. No. 66,938. "A" designates pencil; "B" designates eraser.

Article I Section 8

The Congress shall have Power...

To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;

We the People

of the United States, in order to form a more perfect Union, establish Justice, insure domestic Tranquillity, provide for the common Defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Article 1

Section 1. All legislative Powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives.

Section 2. The House of Representatives shall be composed of Members chosen every second Year by the People of the several States, and the Electors in each State shall have Qualifications requisite for Electors of the most numerous Branch of the State Legislature.

No Person shall be a Representative who shall not have attained to the Age of twenty five Years, and been seven Years a Citizen of the United States, and who, when elected, shall not, when elected, be an Inhabitant of that State in which he shall be chosen.

Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and including Indians not taxed, three fifths of all other Persons. The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall direct. The Number of Representatives shall not exceed one for every thirty thousand, and each State shall have at least one Representative, and each such Enumeration shall be made the Basis of the apportionment.

Each State shall have at least one Representative, and each such Enumeration shall be made the Basis of the apportionment.

When vacancies happen in the Representation from any State, the Executive thereof shall issue writs of Election to fill such Vacancies.

The House of Representatives shall choose their Speaker and other Officers; and shall have the sole Power of Impeachment.

Section 3. The Senate of the United States shall be composed of two Senators from each State, chosen by the Legislature thereof, for six Years, and each Senator shall have one Vote.

Immediately after they shall be assembled in Consequence of the first Election, they shall be divided as equally as may be into three Classes. The Seats of the Senators of the first Class shall be vacated at the Expiration of the second Year, of the second Class at the Expiration of the fourth Year, and of the third Class at the Expiration of the sixth Year, so that one third may be chosen every second Year; and if Vacancies happen by Resignation, or otherwise, during the Term of the Legislature of any State, the Executive thereof may make temporary Appointments until the next Meeting of the Legislature, which shall then fill such Vacancies.

No Person shall be a Senator who shall not have attained to the Age of thirty Years, and been seven Years a Citizen of the United States, and who shall not, when elected, be an Inhabitant of that State for which he shall be chosen.

The Vice President of the United States shall be President of the Senate, but shall have no Vote, unless he be equally divided.

The Senate shall choose their other Officers, and also a President pro tempore, in the Absence of the Vice President, or when he shall exercise the Office of President of the United States.

The Senate shall have the sole Power to try all Impeachments. When sitting for that Purpose, they shall be on Oath or Affirmation. When the President of the United States is tried, the Chief Justice shall preside. And no Person shall be convicted without the Concurrence of two thirds of the Members present.

Judgment in Cases of Impeachment shall not extend further than to removal from Office, and disqualification to hold and enjoy any Office of Honor, Trust, or Profit under the United States; but the Party convicted shall nevertheless be liable and subject to Indictment, Trial, Judgment, and Punishment, according to Law.

Section 4. The Times, Places and Manner of holding Elections for Senators and Representatives, shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by Law make or alter such Regulations, except as to the Places of choosing Senators.

The Congress shall assemble at least once in every Year, and such Meeting shall be on the first Monday in December, unless they shall by Law appoint a different Day.

Section 5. Each House shall be the Judge of the Elections, Returns and Qualifications of its own Members, and a Majority of each shall constitute a Quorum to do Business, but a smaller Number may adjourn from day to day, and may be authorized to compel the Attendance of absent Members, in such Manner, and under such Penalties, as each House may provide.

Each House may determine the Rules of its Proceedings, punish its Members for disorderly Behavior, and, with the Concurrence of two thirds, expel a Member.

Each House shall keep a Journal of its Proceedings, and from time to time publish the same, excepting such Parts as may in this Judgment require Secrecy; and the Yeas and Nays of the Members of either House on any Question shall, at the Desire of one fifth, be entered on the Journal.

Neither House, during the Session of Congress, shall, without the Consent of the other, adjourn for more than three Days, nor to any other Place than that in which the two Houses shall be sitting.

Section 6. The Senators and Representatives shall receive a Compensation for their Services, to be ascertained by Law, and paid out of the Treasury of the United States. They shall in all Cases, except Treason, Felony and Breach of this Peace, be privileged from Arrest during their Attendance at the Session of their respective Houses, and in going to and returning from the same, and for any Speech or Debate in either House; they shall not be questioned in any other Place.

No Senator or Representative shall, during the Term for which he was elected, be appointed to any civil Office under the Authority of the United States which shall have been created, or the Emoluments whereof shall have been increased during such Term; and no Person holding any Office under the United States shall be a Member of either House during his Continuance in Office.

Section 7. All Bills for raising Revenue shall originate in the House of Representatives; but the Senate may propose or concur with Amendments as to the Matter thereof. Money shall not be drawn from the Treasury, but in Consequence of Appropriations made by Law; and the regularity and Period of Payment of all public Debts, and the Service of all the public Funds, shall be secured by Law.

Section 8. The Congress shall have Power to lay and collect Taxes, Duties, Imposts and Excises, to pay the Debts and provide for the common Defence and general Welfare of the United States; but all Duties, Imposts and Excises shall be uniform throughout the United States.

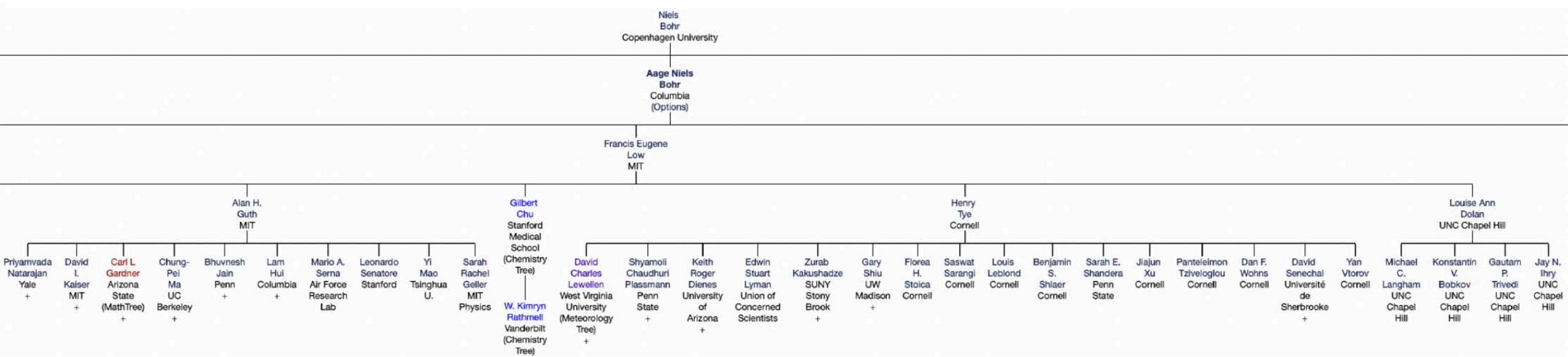
Section 9. The Congress shall have Power to regulate Commerce with foreign Nations, to regulate Commerce among the several States, and with the Indian Tribes; to establish an uniform Rule of Naturalization, and uniform Laws on the Subject of Bankruptcies; to coin Money, to regulate the Value thereof, and the Weights and Measures; to define counterfeiting, and the Punishment therefor; to protect Patents and Copyrights; to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries; to constitute Tribunals inferior to the supreme Court; to exercise the Power of declaring War, granting Letters of Marque and Reprisal, and making Rules concerning the Capture on the Sea; to grant Letters of Marque and Reprisal, and make Rules concerning the Capture on the Sea; to define and punish Piracies and Felonies committed on the Sea, and Offences against the Law of Nations; to punish the Crime of Piracy, and Felonies committed on the Sea, and Offences against the Law of Nations; to define and punish the Crime of Piracy, and Felonies committed on the Sea, and Offences against the Law of Nations.

Section 10. No State shall enter into any Treaty, Alliance, or Confederation; grant Letters of Marque and Reprisal; or coin Money, or emit Bills of Credit; or give any Grant of Feudal Tenure, or any Title of Nobility; or enter into any Compact or Agreement with another State, or with a foreign Power, or with the Indians; nor shall the States be bound by any Act of Congress before the same shall have become a Law, or by any Act of Congress before the same shall have become a Law, or by any Act of Congress before the same shall have become a Law.

Section 11. No State shall be held responsible for any Debts or Contract entered into by any State before the 15th of September 1789.

Section 12. No State shall be held responsible for any Debts or Contract entered into by any State before the 15th of September 1789.

What if our predecessors
had secured that equity?



- We're like a family in many respects

I'll know some of you for 50+ years!

- We aren't too big

2.5k at virtual strings, maybe 5k in extended family, versus
 2.3M Walmart, 1.6M Amazon, 156k Alphabet, 110k Tesla, 12k Space X



VNIVERSITAS
HARVARDIANA

CANTABRIGIAE IN REPUBLICA MASSACHVSETTENSIVM



- Is our identity really the institutions or what we study?
- How long will you be at a given university vs in the field?
- Is our subfield a priority for the institutions we work for?

initiating faculty lines, overhead, transferring grants

The times have changed...

- We appreciate the freedom vs research in a private lab
no borders, and no private interests dictating or using us
- and can still learn from the university / institute system



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'41

WOULD YOU LIKE TO FLY TO RIO?

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—traveling only in daylight hours.
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14 DAYS—with 3 Days in Rio \$665.00
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See Cuba . . . mystic Haiti . . . old Santo Domingo . . . Puerto Rico . . . the lovely West Indies . . . nearly a whole day for pleasure prowling in Trinidad . . . then the picturesque Guianas . . . across the equator and the Amazon, down Brazil's amazing coast . . . to glamorous, exciting Rio de Janeiro—the "most beautiful city in the world!" and back again after 3 or 10 days.

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Can we endow our field?

step 1: alumni relations!!!!

- Brain drain + discrepancy in industry vs academic salary \neq value

need to keep track of our alumni, be kind to them

- We already have an annual conference that could be like a reunion

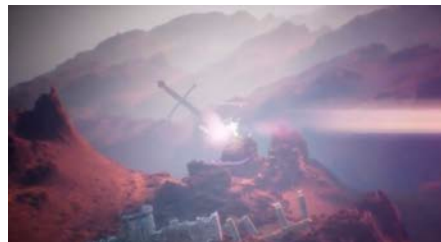
graduation ceremony at strings, local alumni 'string family lunch'

step 2: raise funds

- Capitalize on the goodwill of our esteemed elders while we can
NFTs as a new patronage market
- Create a natural beneficiary for pop-sci books / Hollywood advising / future patents ;)

step 2: raise funds

NFTs as a new patronage market



\$6M

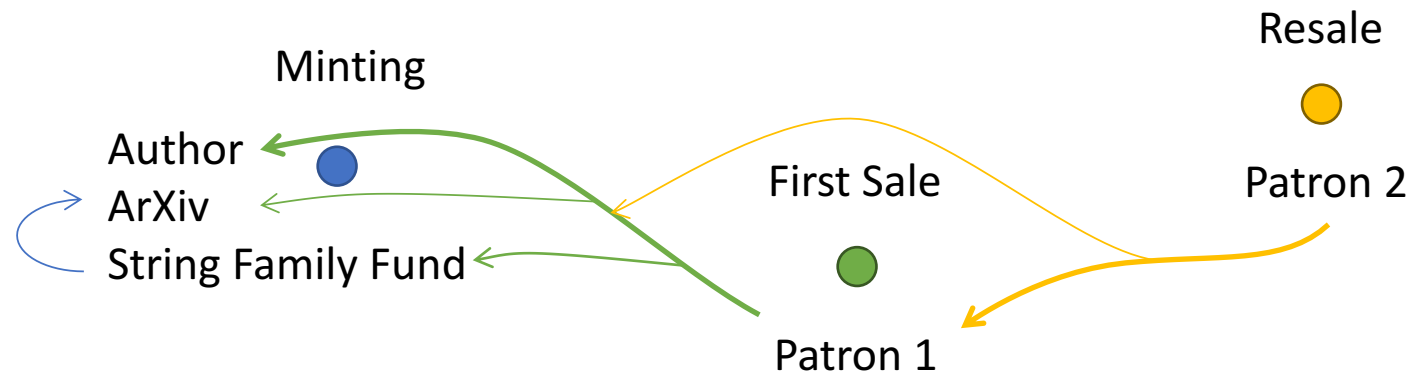


+386 more
and counting

\$3M

step 2: raise funds

NFTs as a new patronage market



Comments: XX pages, X figures,

Subjects: **High Energy Physics - Theory (hep-th)**

Cite as: [arXiv:22XX.XXXXX](#) [hep-th] (or [arXiv:22XX.XXXXXvX](#) [hep-th] for this version)

Patronage Identifier: (contract address, uint256 tokenId)

step 3: start small

- just another foundation = no backreaction
- 1/2 funded postdoc + match program

$\$3\text{M}/\text{year} = \$50\text{k}/\text{year} \times 3 \text{ years for } 20 \text{ postdocs, decouple prestige and fit}$

- funding conferences, ArXiv, inspirehep...

$5\% \text{ of } \$3\text{M} \text{ would } 1/2\text{-endow Strings conference + local matching}$

Strings 2023



- Are we making more work for ourselves? No!

Grant applications (hot topics hog funding), formal Journal vs effective peer review.

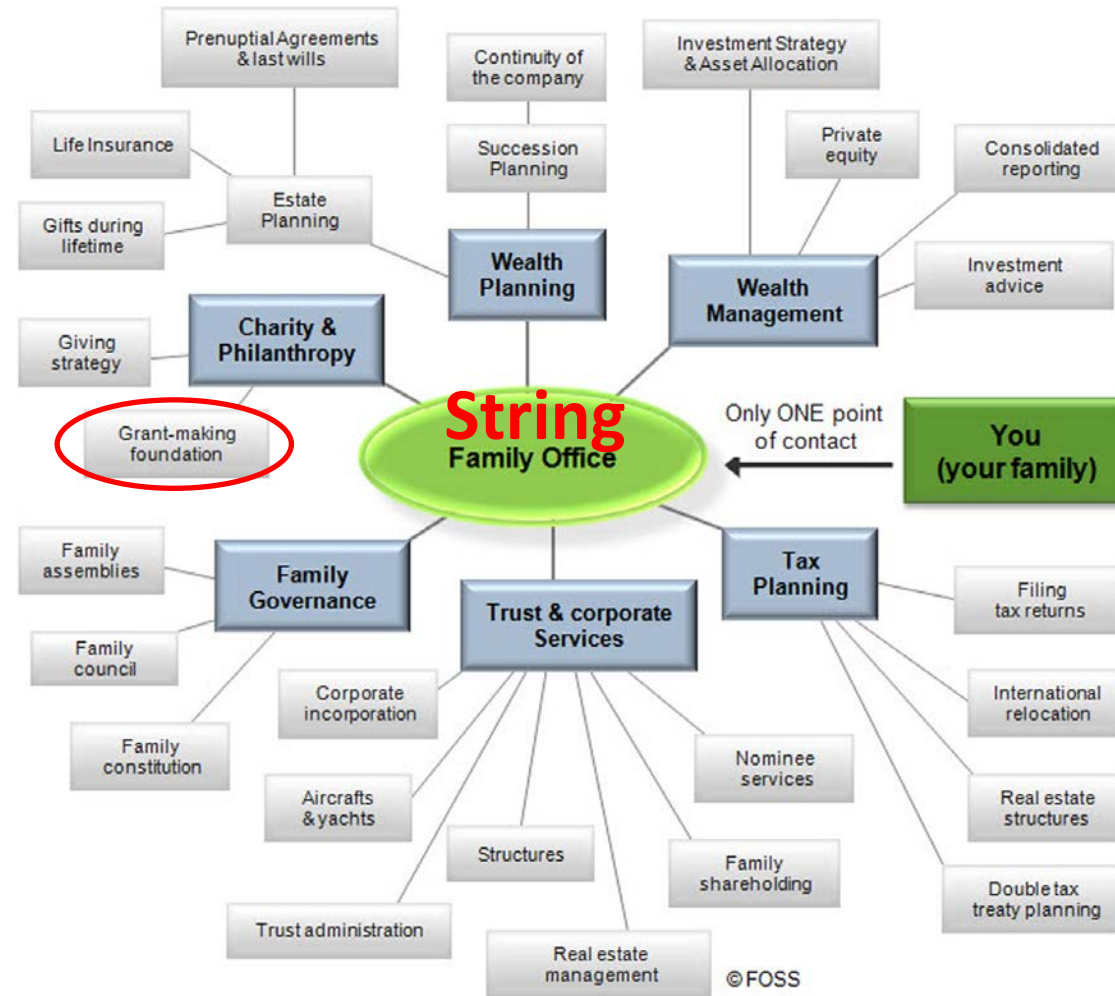
- Would we get too big?

Not necessarily changing size if value associated to PhD, minting new ones dilutes.

- Would we be too small?

Habilitation-like entry could be more inclusive. (Don't want to exclude Dyson!)

Given we're the 'String Family' ...



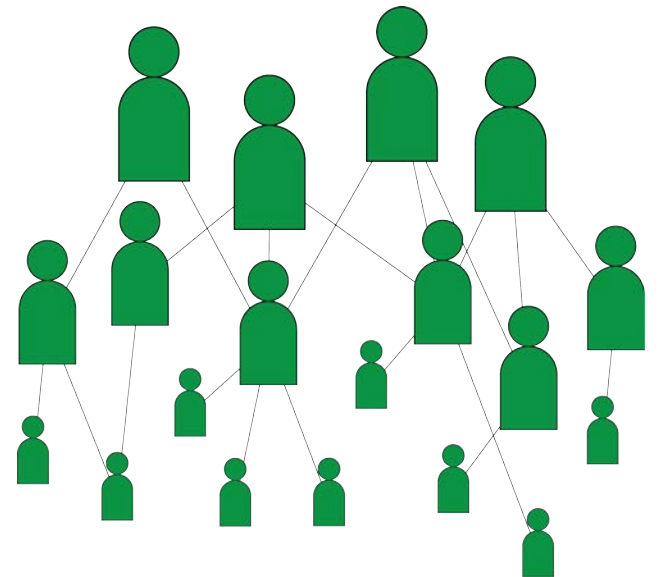
... what would a HNWI do?

- Role of for-profit family office?


reverse brain drain to manage endowment (hedge fund), invest in our start-ups

- Un-exiled ML/AI cousins can help us solve vote delegation + funding allocation questions.

A different hierarchy problem! ;)



- The younger generation missed out on the Superstring Revolutions :(
- But we can *decide* to have our own!

| | | | |
|---|---|-----------------------------------|---|
| Home | Audio and Slides of talks | Program |  |
| Sponsors | Organization | Contact | |
| General Information | Accommodation | Visitor Resources | |
| held at the University of Toronto, Medical Sciences Auditorium –MS (map) King's College Circle | | | |

The Next Superstring Revolution
Tuesday, July 12, 7:00 p.m. - 9:00 p.m.

[RealPlayer Archive of Panel Discussion](#)

The Second Superstring Revolution took place roughly ten years ago. Many feel the times are ripe for the next one. We have organized this session to explore, in an informal and interactive way, possible directions that may lead to major new progress in our field.

We have assembled a panel that represents a sample of the leaders in the subject. During the first half of the session, they will comment briefly on their views of these issues. During the second half, the audience will be invited to offer their ideas. The panel and the audience will be welcome to comment. With some luck a real discussion might start.

We are counting on you to come and actively participate !

Moderator: Steve Shenker (Stanford)

Panelists: Raphael Bousso (UC Berkeley)
Shamit Kachru (SLAC & Stanford)
Ashok Sen (Harish-Chandra Research Institute)
Juan Maldacena (IAS, Princeton)
Andrew Strominger (Harvard)
Joseph Polchinski (KITP & UC Santa Barbara)
Eva Silverstein (SLAC & Stanford)
Nathan Seiberg (IAS, Princeton)

Strings '05
in Toronto



We are part of a much older and more valuable tradition than any individual foundation or university.

We are a family.

We can and we should secure its future and control our destiny.

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