

# Crash course on IP and working with IPO

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Office Hours: Rotating on Wednesdays from 10-11 am



# Agenda

- Basics of patents and copyrights
- Examples of NSD and PSA IP
- How IPO works, and how to work with us

# If you remember anything...

- IP is important to DOE and LBNL and UC
  - It can also benefit you: all co-inventors equally share 35% of the net IP income
- Public disclosures – articles, posters, presentations – can affect IP
- Talk to me or others with IP experience if you have questions (e.g., think you've made an invention)

# What is IP?

- IP is a creation of the intellect, and IP rights are protections granted to creators (e.g., inventors, developers) to control appropriation by others
- Four kinds of IP
  - Patents
  - Copyrights
  - Trademarks
  - Trade secrets
- IPO mostly pursues patents and copyrights, sometimes trademarks, but not trade secrets

# Patents and copyrights

	Patent	Copyright
What it protects	A novel, useful, and non-obvious invention (e.g., chemical, device, process)	Any creative expression in tangible medium (e.g., software, schematic)
Rights it grants	Prevent others from “practicing” (i.e., making, using, or selling) your invention	Prevent others from performing, displaying, reproducing, distributing, or preparing derivative works of your creative expression
Its scope	20 years; country by country	Life of author plus 50-75 years; worldwide
How to get it	Negotiate with (each) patent office for 2-5 years at cost of \$10ks; cannot be in public domain before filing	Immediately granted upon expression in tangible medium; LBNL must assert through DOE

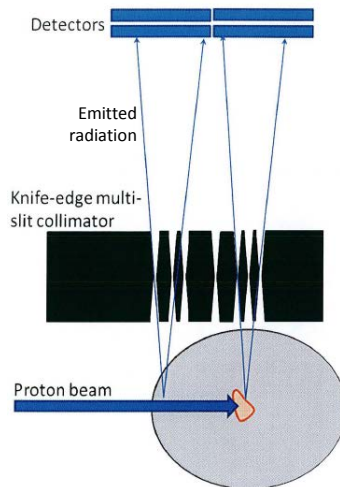


# Example of NSD patent: Dose verification and imaging for ion beam therapy

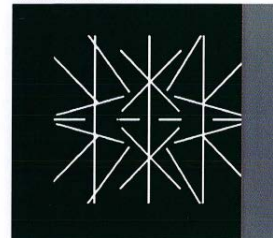



Proton therapy is promising for cancer treatment, but need to better manage dosing

System and method for verifying and imaging proton dosing



Front view of the knife-edge multi-slit collimator





US09849307B2

(12) **United States Patent**  
**Mihailescu**

(10) **Patent No.:** US 9,849,307 B2  
(45) **Date of Patent:** Dec. 26, 2017

(54) **SYSTEM AND METHOD FOR DOSE VERIFICATION AND GAMMA RAY IMAGING IN ION BEAM THERAPY**

(71) Applicant: **Lucian Mihailescu**, Pleasant Hill, CA (US)

(72) Inventor: **Lucian Mihailescu**, Pleasant Hill, CA (US)

(73) Assignee: **The Regents of the University of California**, Oakland, CA (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/886,862**

(22) Filed: **Oct. 19, 2015**

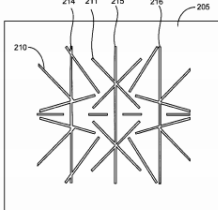
(65) **Prior Publication Data**  
US 2016/0114189 A1 Apr. 28, 2016

**Related U.S. Application Data**  
(60) Provisional application No. 62/066,477, filed on Oct. 21, 2014.

(57) **ABSTRACT**  
This disclosure provides systems, methods, and apparatus related to ion beam therapy. In one aspect, a system includes a position sensitive detector and a collimator. The position sensitive detector is configured to detect gamma rays generated by an ion beam interacting with a target. The collimator is positioned between the target and the position sensitive detector. The collimator includes a plurality of knife-edge slits, with a first knife-edge slit intersecting with a second knife-edge slit.

(58) **Field of Classification Search**  
None  
See application file for complete search history.

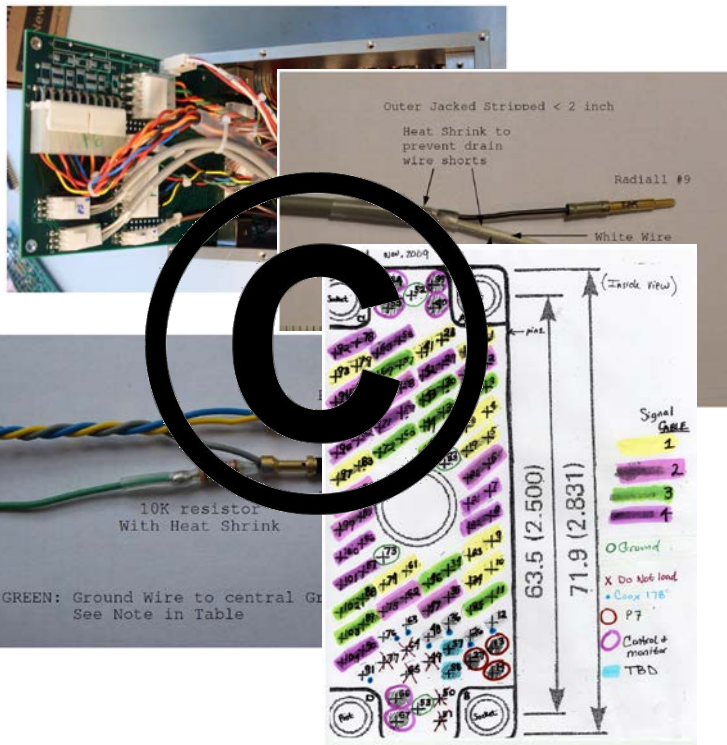
**20 Claims, 7 Drawing Sheets**



# Example of NSD schematic copyright: GRETINA Digitizer

Complex assembly  
described in build manual

GRETINA Digitizer



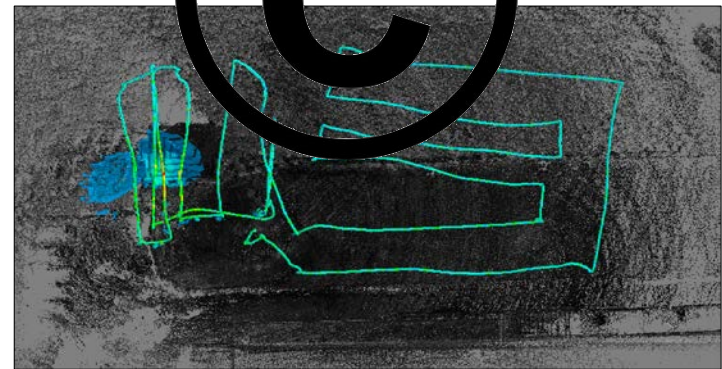
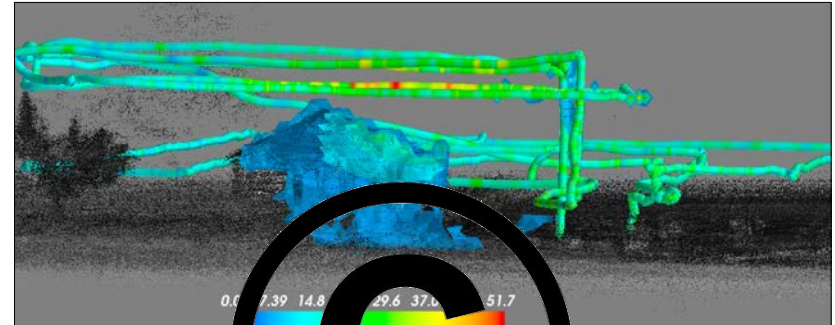


# Example of NSD software copyright: LAMP

Localization and Mapping Platform



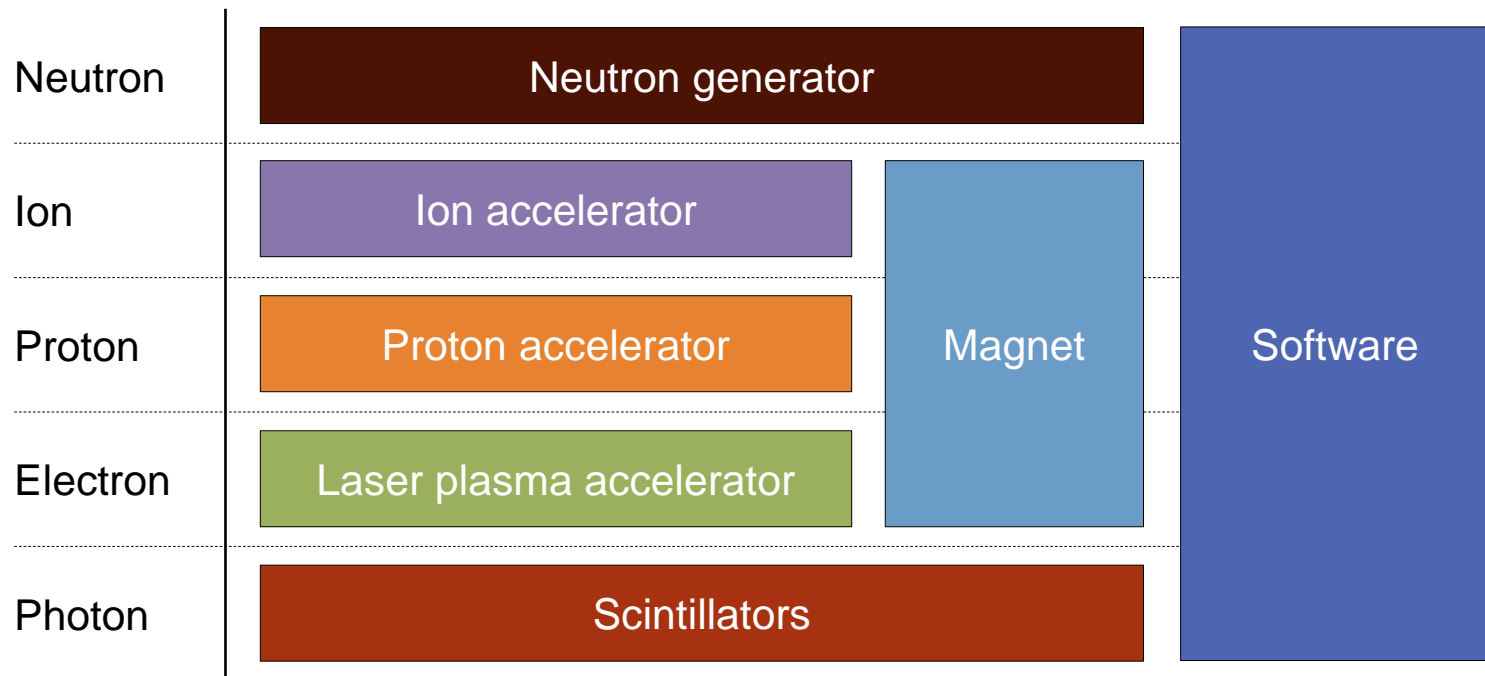
Test house with Cs-137  
source placed in a window



Software merges LiDAR and radiation  
data into single readout (3D map)

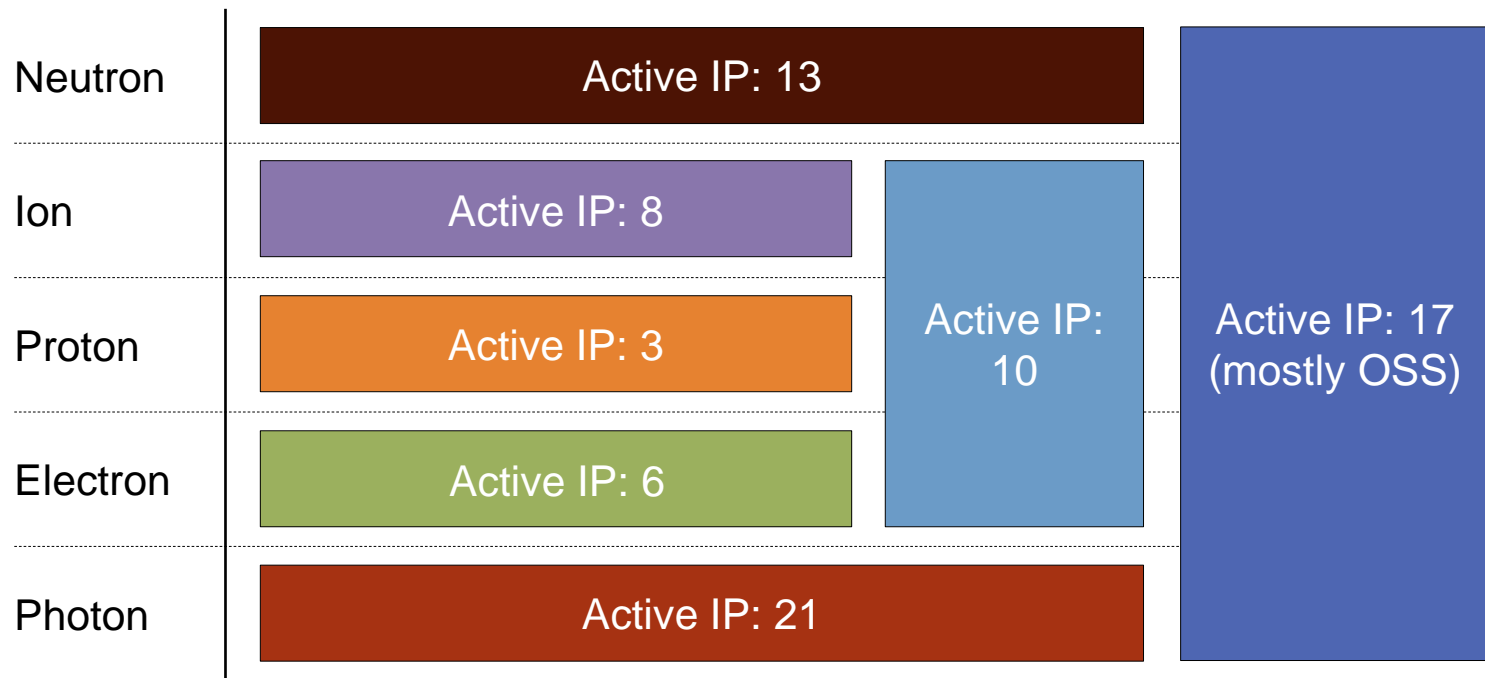


# Physical Sciences portfolios relate to high-energy particles



Note: Active IP as of 1 April 2018, exact values may vary

# Portfolios comprises ~75 active patents and copyrights



Note: Active IP as of 1 April 2018, exact values may vary

# Lifecycle of an LBNL invention

Disclosure



Evaluation



Processing



Licensing



**Russell Carrington, Ph.D.**

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Technology commercialization

- Evaluate and prioritize inventions
- Find industrial partners for licensing and collaboration
- Negotiate business and scoping terms for licenses



**Stephen Glade, Ph.D., J.D.**

[scglade@lbl.gov](mailto:scglade@lbl.gov)

Patent attorney

- Prosecute and manage intellectual property
- Provide legal guidance on licensing



**Catherine Koh**

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Contracts – Licensing

- Negotiate T&Cs for NDAs, MTAs, and licenses
- Ensure compliance with terms and conditions



# How to disclose

- Complete Record of Invention (ROI) for an invention or Software Disclosure (SD) for software through Innovation Portal (<http://ipo.lbl.gov/innovation-portal/>)
- Important sections
  - Inventors / Authors
  - Funding
  - Background, description, and potential uses
  - Public disclosures (ROI) / Third Party code (SD)

# Why evaluate

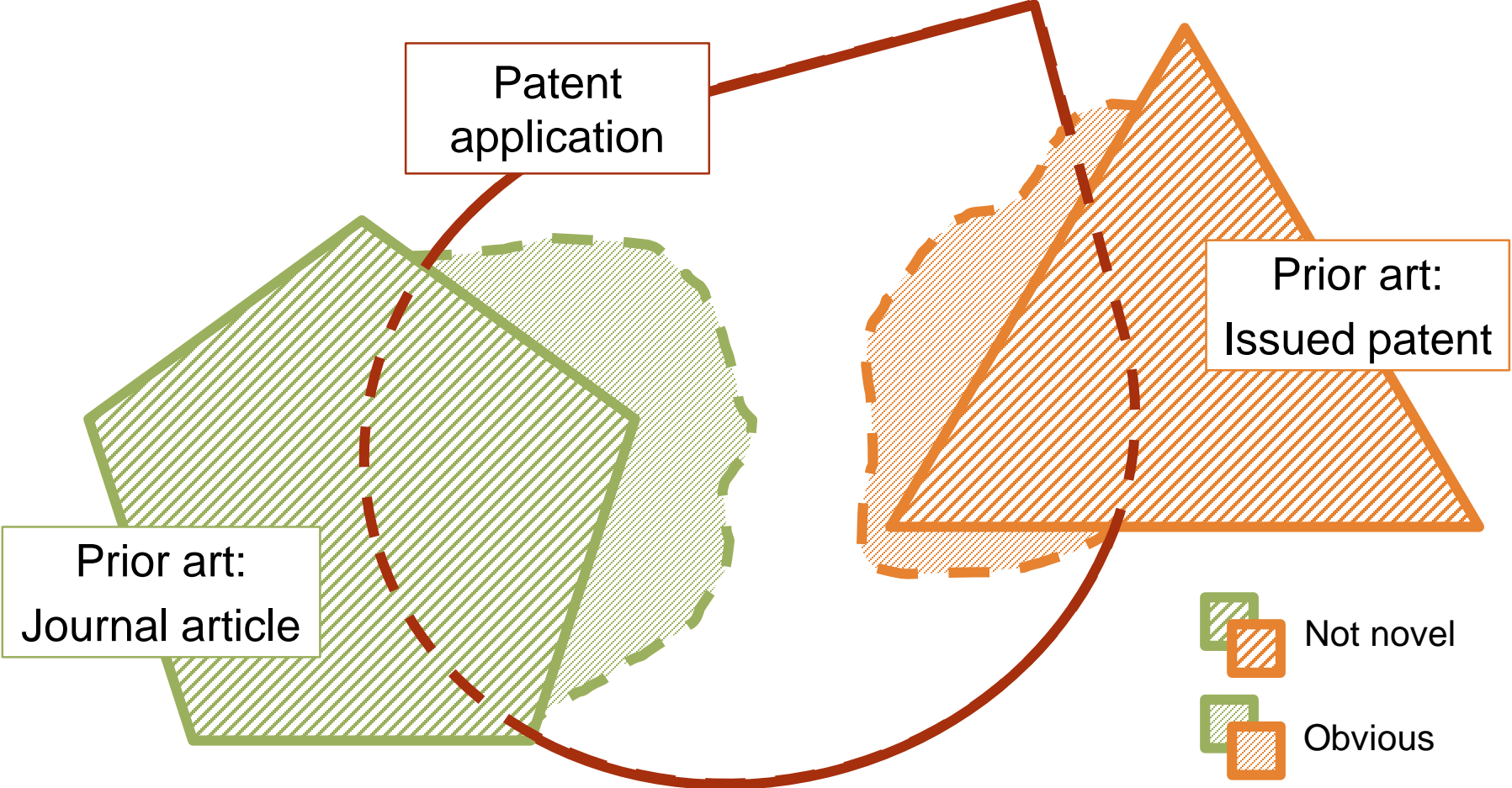
- IPO receives hundreds of ROIs a year and must evaluate whether to pursue patent protection on each
- The evaluation looks at
  - Patentability (Will a patent issue?) and enforceability (Is it practical to enforce the patent once it issues?)
  - Commercial potential
    - Does the invention address an acute pain in the market, or are existing solutions “good enough”?
    - Do the advantages and potential revenue/profit justify the costs and risk associated with a recent invention?
    - Can the invention scale to meet market demand?
    - Ultimately, will someone pay to license the patent?
- For software, IPO must determine the best licensing approach: open source, academic, commercial, or some combination thereof

Note: The evaluation is unrelated to the value or quality of the underlying research as a scientific endeavor!

# Overview of patent prosecution

- Prosecution is a discussion between the USPTO examiner and patent attorney to find the “white space”, the useful, novel, and non-obvious inventions in the application
- Examiner is not the enemy (e.g., they don’t presume non-patentability), they ensure patent law is properly implemented

# Inventive “white space”





# Why license IP?

- LBNL must partner with industry – startups, established companies, etc. – to commercialize our inventions and software
- Partnership is accomplished through licensing IP rights to LBNL inventions and software
- Licensing rights is not equivalent to selling rights, licensing a patent or software is analogous to leasing a car
- Licensing requires LBNL has an IP asset – patent application, issued patent, asserted copyright – for that invention or software

# Thank you!

More questions?

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# Appendix

What is a public disclosure? Why are they important?



# The relationship between public disclosures and patents

- The first public disclosure sets the bar date for the invention; in essence, the bar date establishes when the public disclosure can be used as prior art (see slide(s) on novelty)
  - International rights are lost if a patent application isn't filed before the bar date
  - US rights are lost if an application isn't filed within 1 year of the bar date
  - All patent rights are lost one year after the bare date
- An ROI does not protect IP (i.e., ROI  $\neq$  patent application), it simple reports an invention to IPO

# More on “What constitutes a public disclosure?”

- The key is whether the disclosure is available to the public
- Examples of public disclosures
  - Publication in a journal or on the internet
  - Abstract, presentation, or poster at a non-confidential conference
  - Thesis put in library and indexed
  - Discussions or presentations with non-LBNL employees, unless non-LBNL employees are bound by a confidentiality agreement
  - Grant abstracts or applications (through FOIAs), unless grantor is bound by a confidentiality agreement; can add “Business Confidential” to header/footer of sensitive pages
- Examples that aren’t public disclosures
  - Submission of paper to journal for review or publication
  - Abstract, presentation, or poster at a confidential conference
  - Thesis put in library but NOT indexed
  - Discussions or presentations under a proper NDA

# When to disclose

- In general, wait to disclose until you...
  - Conceive the invention, i.e., have an idea for an experiment
  - Reduce to practice the invention, i.e., performed the key experiment and the invention works
- The best time to disclose is...
  - Before you submit a grant proposal
  - After you have written the first draft or are thinking about giving a public presentation
  - When competition is “hot on your heels”
  - When there is serious company interest
- Try to avoid disclosing...
  - When you submit a manuscript for review
  - Right before a paper publishes or a presentation is given (public disclosure)



# How to avoid public disclosures

- There are several ways to avoid disclosing the invention before you're ready to
  - Be vague or ambiguous in describing the invention: “Using the ~~Pseudomonas butanovera BmoR~~ a *bacterial* activator protein as an in vivo biosensor”
  - Treat the invention as a black box, but describe what goes in and what comes out



# Appendix

What qualifies as an invention?



# An invention must have patentable subject matter

- Patentable subject matter
  - Composition of matter
  - Device or apparatus
  - Process of making or using a composition, device, or apparatus
- Unpatentable subject matter
  - Law of nature – No patenting gravity!
  - Natural phenomena – Or fire!
  - Abstract ideas – It must be tangible
  - Process consisting solely of mathematical operations – Again, tangible...
  - “A strategy for reducing, avoiding, or deferring tax liability”
  - “A human organism”

# An invention must be novel

- An invention is not novel if it's disclosed or described in a single prior art reference
- All of the following are prior art
  - Patented
  - Described in a printed publication
  - In public use
  - On sale
  - Otherwise available to the public

# An invention must be non-obvious

- An invention must be non-obvious “to a person of ordinary skill in the relevant art”
- An invention is obvious if a combination of two or more prior art references teaches/suggests the invention with a reasonable expectation of success
- Arguments for non-obviousness:
  - Combination destroys purpose of invention
  - Unexpected results
  - Change in quality
  - Synergism
  - References teach away from invention
  - Commercial success

# Appendix

What is the timeline for patent prosecution?

# Prosecution timeline

