PHYSICS ILLINOIS
University of Illinois at Urbana-Champaign

∂Physics_of_Law /∂t

Sam Petuchowski
(Ph.D., Phys., 1979)

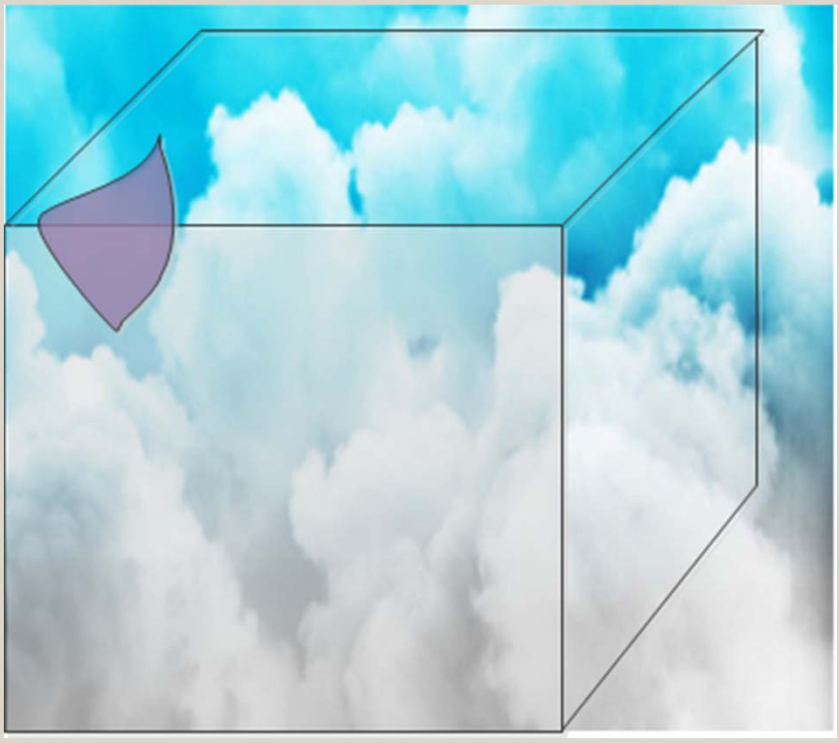
PHYSICS CAREERS SEMINAR

March 30, 2012

Roadmap

- What you can do as a patent attorney, and what's interesting about it
  - Variety
  - Flux
  - It matters
- How you get there
- The physics edge
  - Discussion

A Neighborhood in the Space of Ideas



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WINNING INTELLECTUAL PROPERTY

A Neighborhood in Boston

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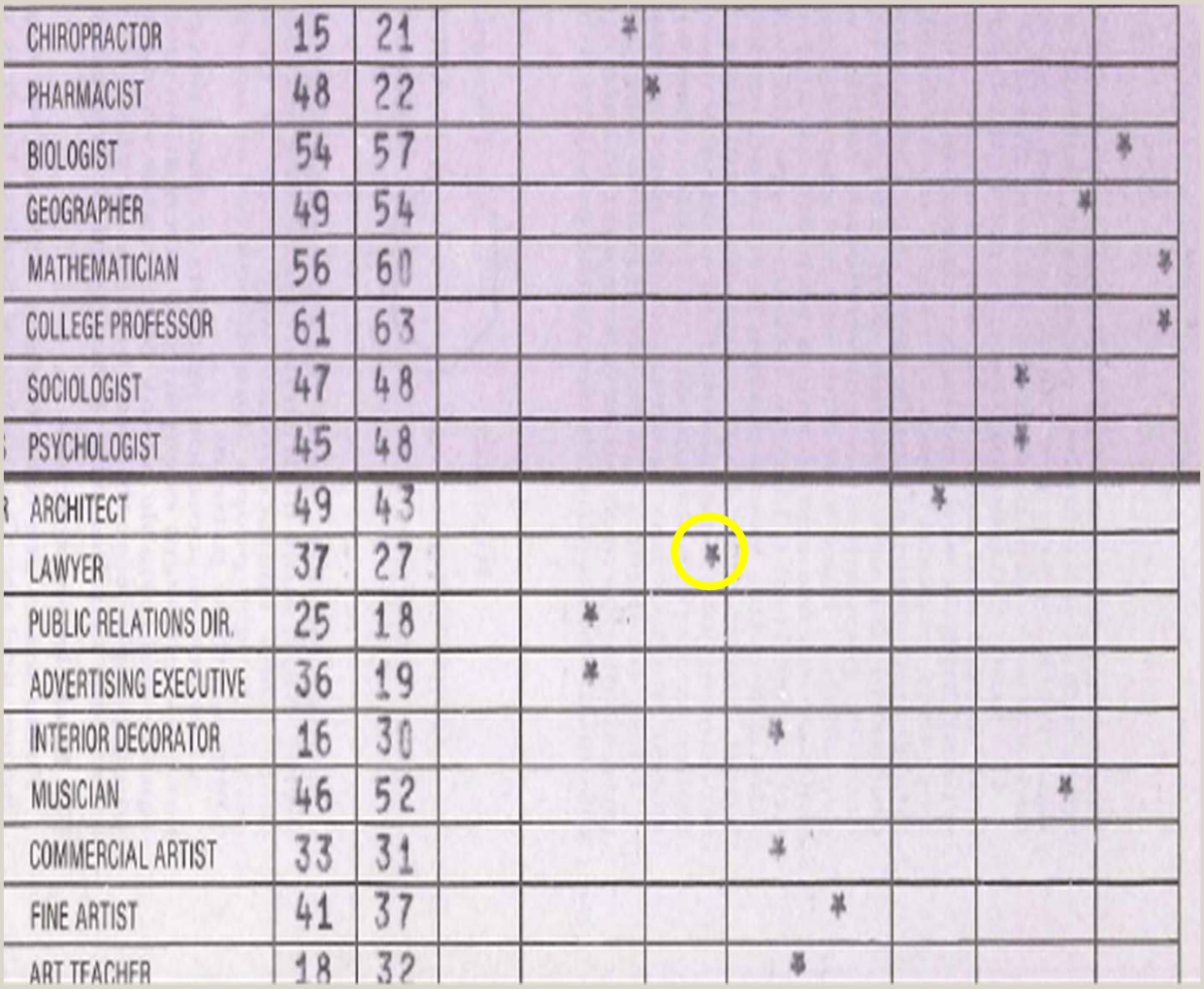
WINNING INTELLECTUAL PROPERTY

Deciding what you like to do - Strong-Campbell Interest Inventory



CHIROPRACTOR	15	21		*					
PHARMACIST	48	22			*				
BIOLOGIST	54	57							*
GEOGRAPHER	49	54						*	
MATHEMATICIAN	56	60							*
COLLEGE PROFESSOR	61	63							*
SOCIOLOGIST	47	48						*	
PSYCHOLOGIST	45	48						*	
ARCHITECT	49	43					*		
LAWYER	37	27			*				
PUBLIC RELATIONS DIR.	25	18		*					
ADVERTISING EXECUTIVE	36	19		*					
INTERIOR DECORATOR	16	30				*			
MUSICIAN	46	52						*	
COMMERCIAL ARTIST	33	31				*			
FINE ARTIST	41	37					*		
ART TEACHER	18	32				*			

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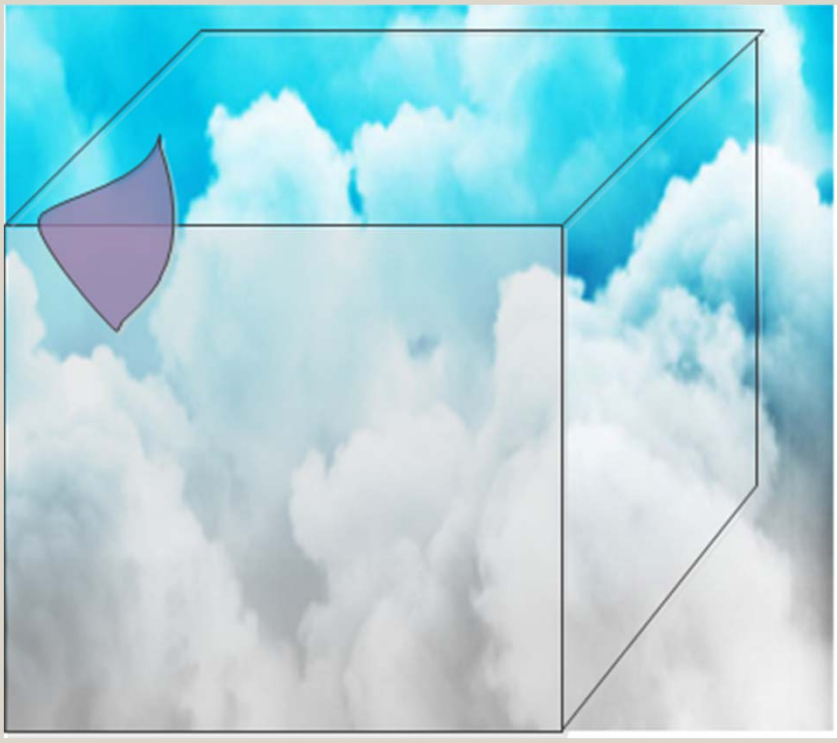

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WINNING INTELLECTUAL PROPERTY

Roles of a Patent Attorney

a. advise clients about the value of (prospective) patent – domestically, internationally
b. help clients structure portfolios – patents/ trade secret trade – hinges on stage of business
c. counsel clients with respect to in- and out-licensing of IP
d. counsel clients with respect to patentability of inventive concepts
e. prepare and prosecute patent applications

More Roles of a Patent Attorney

f. challenge/defend patents

g. evaluate portfolios – due diligence

h. patent enforcement

i. testify as patent expert

j. flag significant legal developments

k. professional involvement and advocacy

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Variety

- Client types
  - Individual inventor (docs are over-represented)
  - (typically academic) spin-offs and other early-stage new ventures
  - Contract innovators
  - Research institutions
  - Small/mid-size businesses
  - Divisions of large corporations, some multinational

Variety

- By legal issue presented
- By subject matter

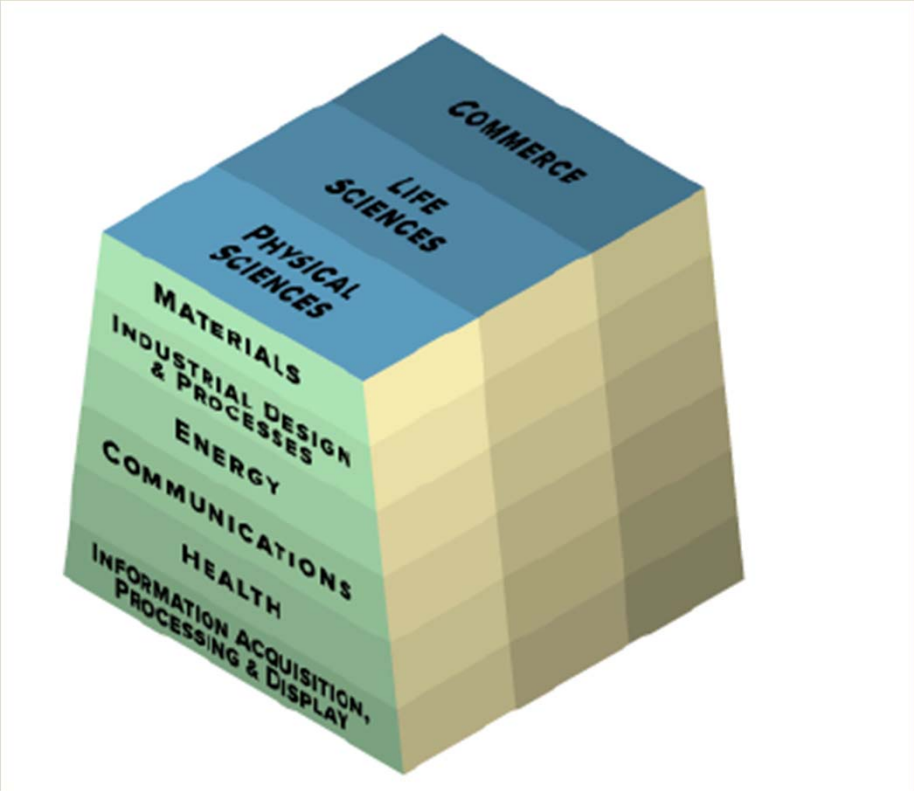
Subrahmanyan Chandrasekhar

- 1929-39 - stellar structure including the theory of white dwarfs
- 1939-43 – stellar dynamics
- 1943-50 –radiative transfer; quantum theory of H^-
- 1951-61 hydrodynamic and hydromagnetic stability
- 1960s - equilibrium stability of ellipsoidal figures of equilibrium; general relativity
- 1971 - 1983 – black holes
- late 80s - colliding gravitational waves

Nobel Prize: 1983

Thinking Inside the Boxes: A Taxonomy of Sunstein Representative Technologies

- Each broad field of human enterprise across the top is served by technologies represented by the bands along the left. Mouse over the blank boxes to see specific areas where we have experience.



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- Flux

- Coupling to economy
  - enabling ventures, industries
- The three branches of government and a pendulum of strengthening/weakening IP protection
  - 80s/90s; 00s
- Conceptualization

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Prometheus Claim 1

1. A method of optimizing therapeutic efficacy for treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said immunemediated gastrointestinal disorder; and

(b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder,

wherein the level of 6-thioguanine less than about 230 pmol per 8x 10^8 red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject, and

wherein the level of 6-thioguanine greater than about 400 pmol per 8x 10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

On the one hand …

Mayo Collaborative Services v. Prometheus Labs – Supreme Court decision, March 20, 2012

(Unanimous opinion, written by Justice Breyer)

"Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work."

… And monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it.

On the other hand …

- The Court has recognized, however, that too broad an interpretation of this exclusionary principle could eviscerate patent law. For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.

‘A third hand …

Still, as the Court has also made clear, to transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words “apply it.”

Some Open Questions

- What should be patentable?
  - Abstract?
  - Aristotle's types of knowledge:
    - Episteme – scientific knowledge
    - Techne – skill & craft knowledge
    - Phronesis – practical wisdom – statecraft, etc.
- What is obvious?

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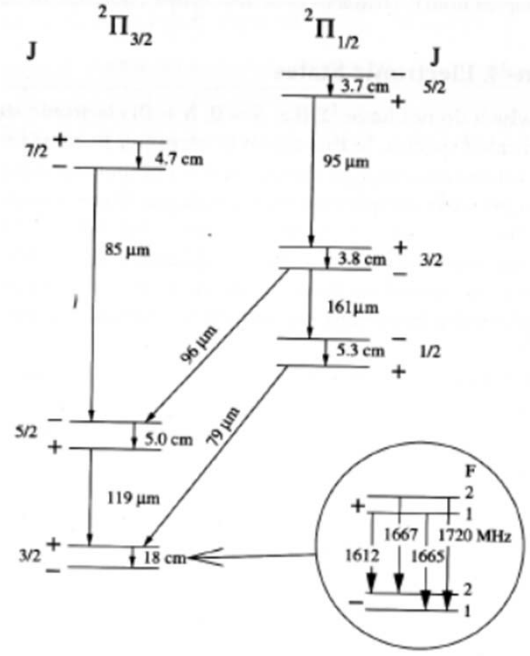
‘A concept – high hopes . . .



Jonathan Tennyson, *Astronomical Spectroscopy*, Fig. 10.17 (Imperial College Press, 2005)

... science ...

THE ASTROPHYSICAL JOURNAL, 348:L45–L48, 1990 January 10

IN SITU MEASUREMENT OF THE COSMIC MICROWAVE BACKGROUND TEMPERATURE AT A DISTANCE OF 7.5 KILOPARSECS

A. KOGUT,[1] S. J. PETUCHOWSKI,[2] C. L. BENNETT,[2] AND G. F. SMOOT[1]
Received 1989 September 8; accepted 1989 October 25

ABSTRACT

We have used absorption of orthoformaldehyde (H_2CO) toward the giant H II region W51A (G49.5–0.4) as a remote probe of the cosmic microwave background (CMB) at a distance of 7.5 kpc. VLA observations of the 6 cm and 2 cm wavelength transitions provided sufficient resolution and sensitivity to resolve condensations within the foreground clouds. Solutions to the equations of statistical equilibrium within each condensation in the context of a large velocity gradient model yielded an estimate for the CMB temperature at 2.1 mm wavelength of 3.2 ± 0.9 K. The uncertainty is dominated by modeling of collisional pumping by neutral hydrogen molecules (H_2). The result is the most distant measurement of the CMB to date. We discuss possible extension of the technique to systems with moderate redshift as a test of a primeval origin of the CMB.

Subject headings: cosmic microwave background — interstellar: molecules — nebulae: individual (W51)

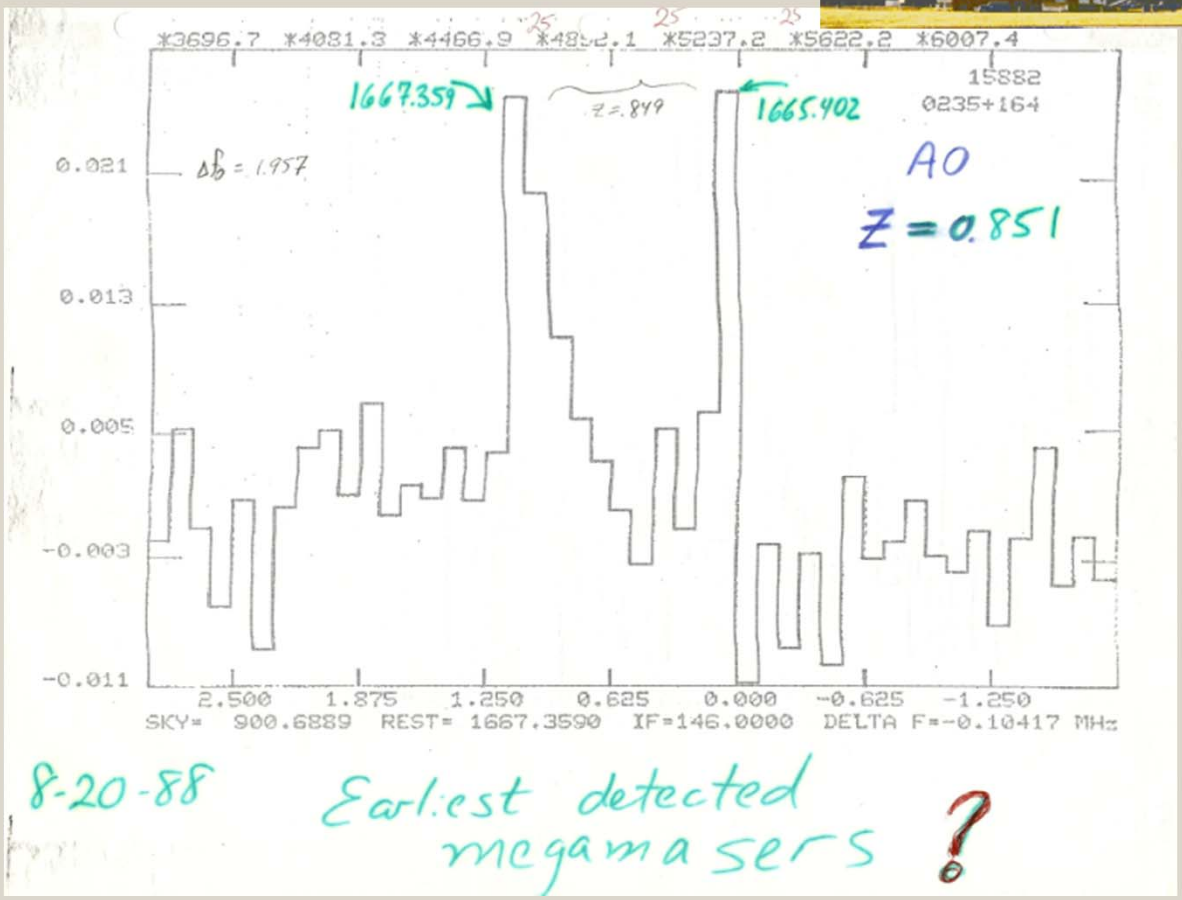
I. INTRODUCTION

The standard model of cosmology interprets the cosmic microwave background (CMB) as a relic of a hot, dense phase in the early universe. The argument for a cosmological origin to this radiation rests primarily on its observed isotropy ($\Delta T/T < 10^{-4}$; Readhead *et al.* 1988; Davies *et al.* 1987; Uson and Wilkinson 1984) and cannot rule out a local origin. The standard (Genzel *et al.* 1981), making this measurement the most distant probe of the CMB to date.

II. CONCEPT

The lower lying rotational energy levels of orthoformaldehyde are shown in Figure 1, with allowed transitions between the states. Observations of the doublet transitions in

never-published data



...crushed

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Phys. Rev./ Patent Acceptance Criteria

- *Phys Rev* and *PRL* "publish new physics." — NOVELTY
- Findings must not be a marginal extension of previously published work — NON-OBVIOUS-NESS
- **Substance**: — UTILITY
  - Validity
  - Importance
  - Broad Interest

Conclusion

- I hope to have conveyed a “taste” of the practice of patent law

Sam Petuchowski
spetuchowski@sunsteinlaw.com