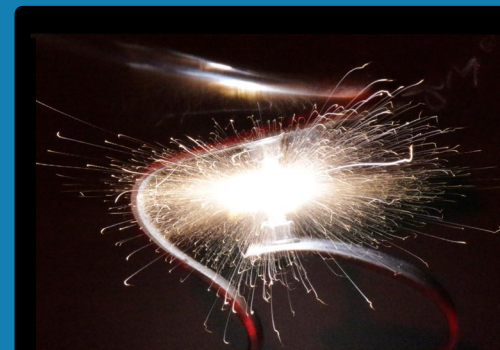


Engineering Dense Hydrogen Based Energy Systems

Simon Brink

Environmental Engineer

World Engineers Convention, November 2019



Subtle Atomics

Climate Emergency

An underwater photograph showing a coral reef in a state of bleaching. The coral appears mostly white and yellow, with some patches of pink and purple. A single blue fish is visible in the upper center of the frame, swimming against the clear blue water.

“...one third of the Great Barrier Reef is now dead”

Prof. Terry Hughes, 2016

The Real Climate Challenge

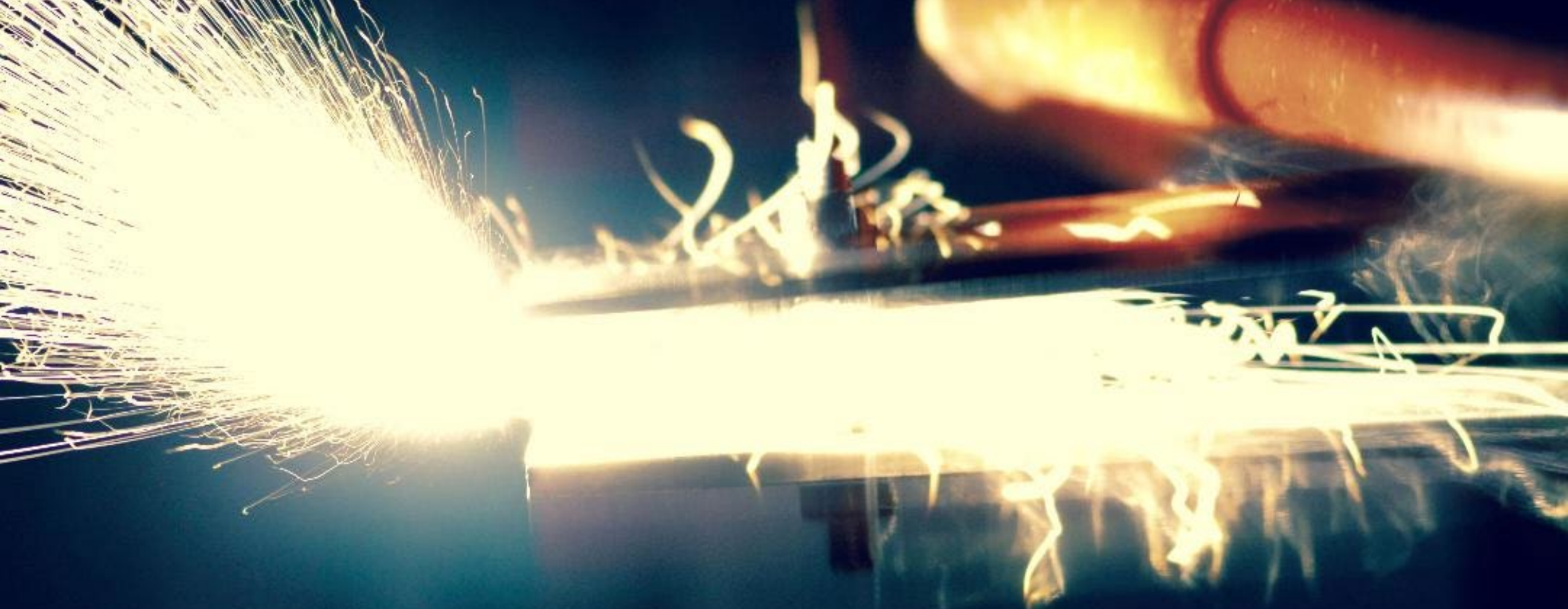
Now: 1.2°C above pre-industrial (~1700)

LAG

Ocean, ice & geological lag +0.6°C

Sulphate emission cooling +0.5°C

Already “locked in” to >2°C



***Can new technology keep
us to under +3 deg C?***

New Directions in Physics

Background
energy

Fusion doesn't
power the sun

Toroidal
nuclear
physics

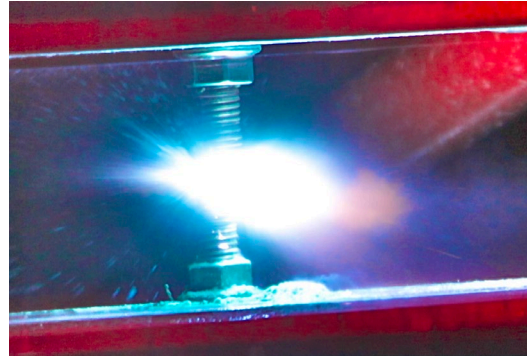
Electrons are
not points

Expanding
earth theory

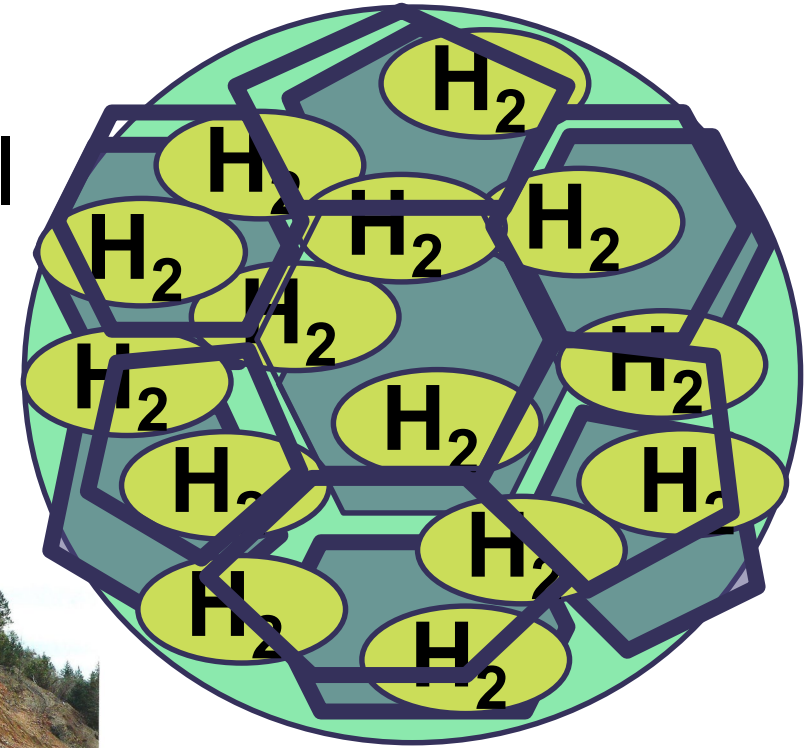
Black holes as
super-nuclei

Dense Hydrogen – What is it?

Extreme ultraviolet state transitions



Geological dense hydrogen



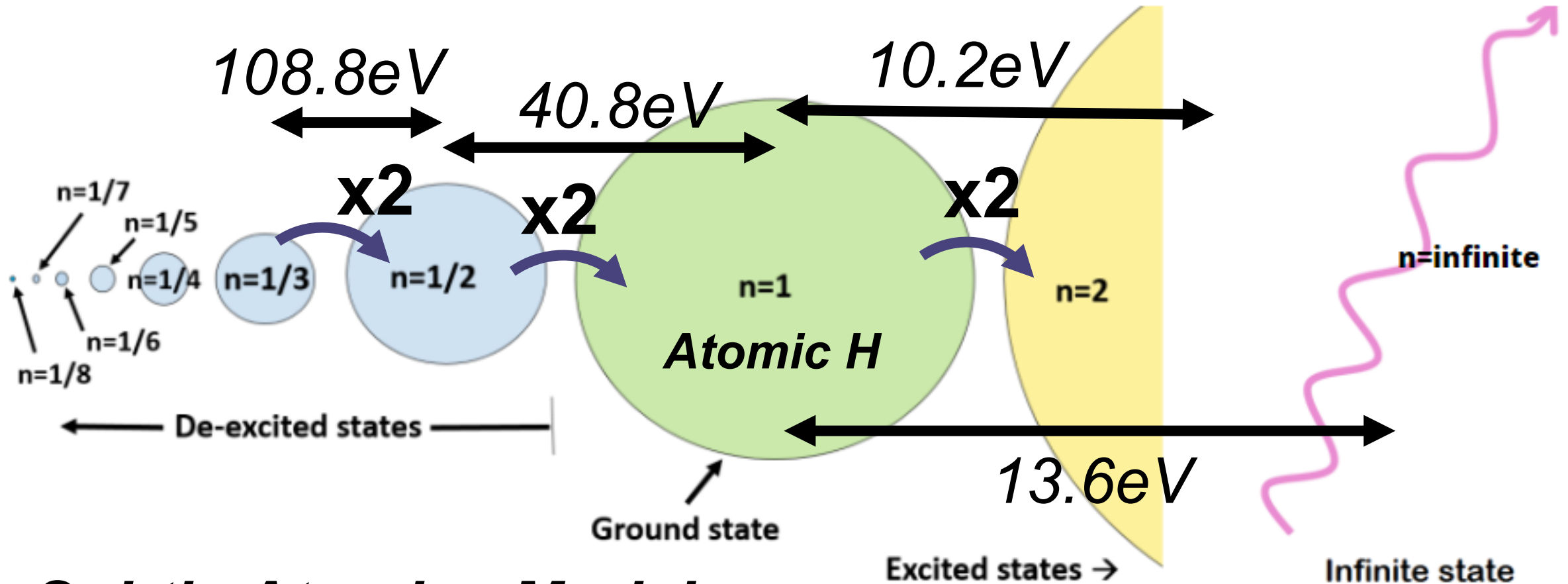
$$H_2(n \approx 1/4)$$



Excess heat & transmutation observations



Dense Atomic Hydrogen Physics



Subtle Atomics Model



Changing the Rydberg Model

New size relationship:

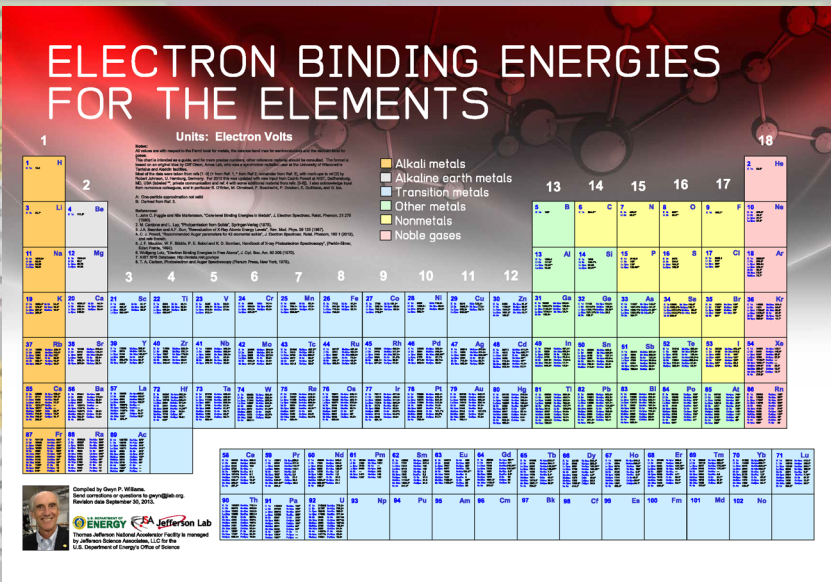
Rydberg: Linear, based on “ground state”

Subtle Atomics: Exponential, 2x previous state

Dense Atomic Hydrogen Catalysts

	To n=1/2	To n=1/3	To n=1/4	To n=1/5	To n=1/6	To n=1/7	To n=1/8	To n=1/9	To n=1/10	To n=1/11	To n=1/12																					
Selenium	54.6	0.33%	Copper	122.5	0.04%	Praseodymium	217.8	-0.04%	Palladium	340.5	0.11%	Tungsten	490.4	0.12%	Indium	665.3	-0.21%	Tellurium	870.8	0.03%	Radon	1097.0	-0.40%	Lanthanum	1362.0	0.11%	Selenium	1652.0	0.35%	Demium	1960.0	0.04%
Lithium	54.7	0.51%	Thallium	122.2	-0.21%	Thulium	220.0	1.06%	Ytterbium	339.7	-0.13%	Tin	493.2	0.65%	Palladium	671.8	0.74%	Neon	870.2	-0.06%	Copper	1096.7	-0.45%	Arsenic	1356.1	-0.11%	Lutetium	1639.0	-0.44%	Terbium	1968.0	0.45%
Thulium	54.7	0.51%	Thulium	122.9	0.37%	Thulium	214.4	-1.51%	Terbium	342.4	0.66%	Iridium	495.8	1.22%	Osmium	658.2	-1.27%	Nickel	870.0	-0.09%	Samarium	1110.9	0.80%	Promethium	1357.0	-0.26%	Hafnium	1662.0	0.95%	Ytterbium	1950.0	-0.47%
Osmium	53.4	-1.88%	Radon	123.0	0.45%	Radon	214.0	-1.70%	Platinum	343.5	0.99%	Ruthenium	483.5	-1.29%	Thorium	675.2	1.28%	Iodine	875.0	0.49%	Gallium	1116.4	1.30%	Holmium	1351.0	-0.70%	Dysprosium	1676.0	1.80%	Rhenium	1949.0	0.52%
Palladium	55.7	2.3%	Germanium	120.8	-1.3%	Rhodium	213.2	-2.06%	Rhodium	343.5	0.99%	Rhodium	496.5	1.37%	Xenon	676.4	1.46%	Radium	879.0	0.95%	Lanthanum	1128.0	2.35%	Praseodymium	1337.0	-1.73%	Krypton	1678.4	1.55%	Strontium	1940.0	-0.98%
Iron	52.7	1.7%	Neodymium	120.5	-1.4%	Cerium	223.2	2.53%	Gold	335.1	-1.48%	Scandium	498.0	1.67%	Bismuth	678.8	1.82%	Cerium	883.8	1.50%	Iodine	1072.0	-2.73%	Dysprosium	1333.0	-2.03%	Europium	1614.0	-1.96%	Holmium	1923.0	-1.85%
Niobium	56.5	1.63%	Promethium	120.0	0.00%	Neodymium	224.8	3.17%	Calcium	346.57	1.89%	Ytterbium	480.5	-1.90%	Mercury	680.2	2.03%	Tin	884.7	1.60%	Cesium	1071.0	-2.82%	Thorium	1330.0	-2.25%	Terbium	1611.0	-2.14%	Krypton	1921.0	-1.95%
Ytterbium	55.5	-4.45%	Bismuth	119.0	-2.82%	Tantalum	226.4	4.0%	Dysprosium	333.5	-1.95%	Molybdenum	486.3	3.37%	Cadmium	652.6	-2.11%	Lanthanum	853.0	-2.04%	Sodium	1070.8	-2.84%	Neodymium	1403.0	3.12%	Gadolinium	1688.0	2.53%	Erbium	2006.0	2.39%
			Mercury	127.0	3.71%	Molybdenum	227.9	4.0%	Lutetium	347.2	2.07%	Lutetium	498.0	3.47%	Manganese	649.9	-2.52%	Lead	891.8	2.82%	Europium	1409.0	3.56%	Erbium	1596.0	-2.1%	Lutetium	2024.0	3.31%			
			Radon	123.0	3.71%	Platinum	332.6	-2.22%	Thulium	470.7	-3.99%	Gold	642.7	-3.80%	Thallium	846.2	-2.82%	Barium	1137.0	3.17%	Germanium	1414.6	3.97%	Ytterbium	1576.0	-4.27%	Thulium	1885.0	-3.79%			
			Aluminium	117.8	-3.80%	Platinum	331.6	-2.51%	Platinum	470.7	-3.99%	Gold	642.7	-3.80%	Iron	844.6	-1.00%	Iron	1058.0	-4.00%	Magnesium	1303.0	-4.23%	Neodymium	1575.0	-4.33%	Gadolinium	1881.0	-3.99%			
						Samarium	326.7	-3.95%	Samarium	471.1	3.56%	Iridium	691.1	3.56%	Fluorine	996.7	4.50%	Radium	1148.7	4.55%	Samarium	1420.0	4.37%	Samarium	1723.0	4.88%	Tungsten	2040.0	4.12%			
						Vanadium	321.0	-4.07%	Niobium	470.7	-3.99%	Chromium	696.8	4.40%	Fluorine	996.7	4.50%	Radium	1058.0	-4.00%	Promethium	1357.0	-0.26%	Lutetium	1639.0	-0.24%	Demium	1960.0	0.21%			
						Niobium	470.7	-3.99%	Niobium	642.7	-3.80%	Chromium	696.8	4.40%	Fluorine	996.7	4.50%	Radium	1058.0	-4.00%	Promethium	1357.0	-0.26%	Lutetium	1639.0	-0.24%	Demium	1960.0	0.21%			
						Niobium	470.7	-3.99%	Niobium	642.7	-3.80%	Chromium	696.8	4.40%	Fluorine	996.7	4.50%	Radium	1058.0	-4.00%	Promethium	1357.0	-0.26%	Lutetium	1639.0	-0.24%	Demium	1960.0	0.21%			

Cu Pr Pd, Yb W Te, Ne, Ni La, As Os



$$H(n=\infty) \rightarrow H(n \leq 1)$$

“explains 30+ years of excess heat and transmutation observations from electro-chemical LENR”



Dense Hydrogen Technologies



Elemental
transmutation



Advanced
materials



Nuclear waste
deactivation

New Energy Technologies

Super-Chemical



Low Energy Nuclear



Sub-Nuclear



Super-Chemical Reactions



H(n=1/3) catalyst: Copper – $M_i 3s = 122.5 \text{ eV}/c^2$

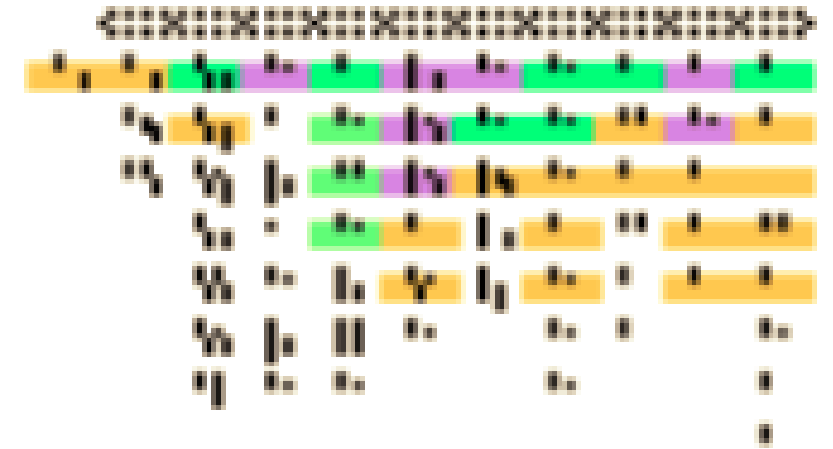
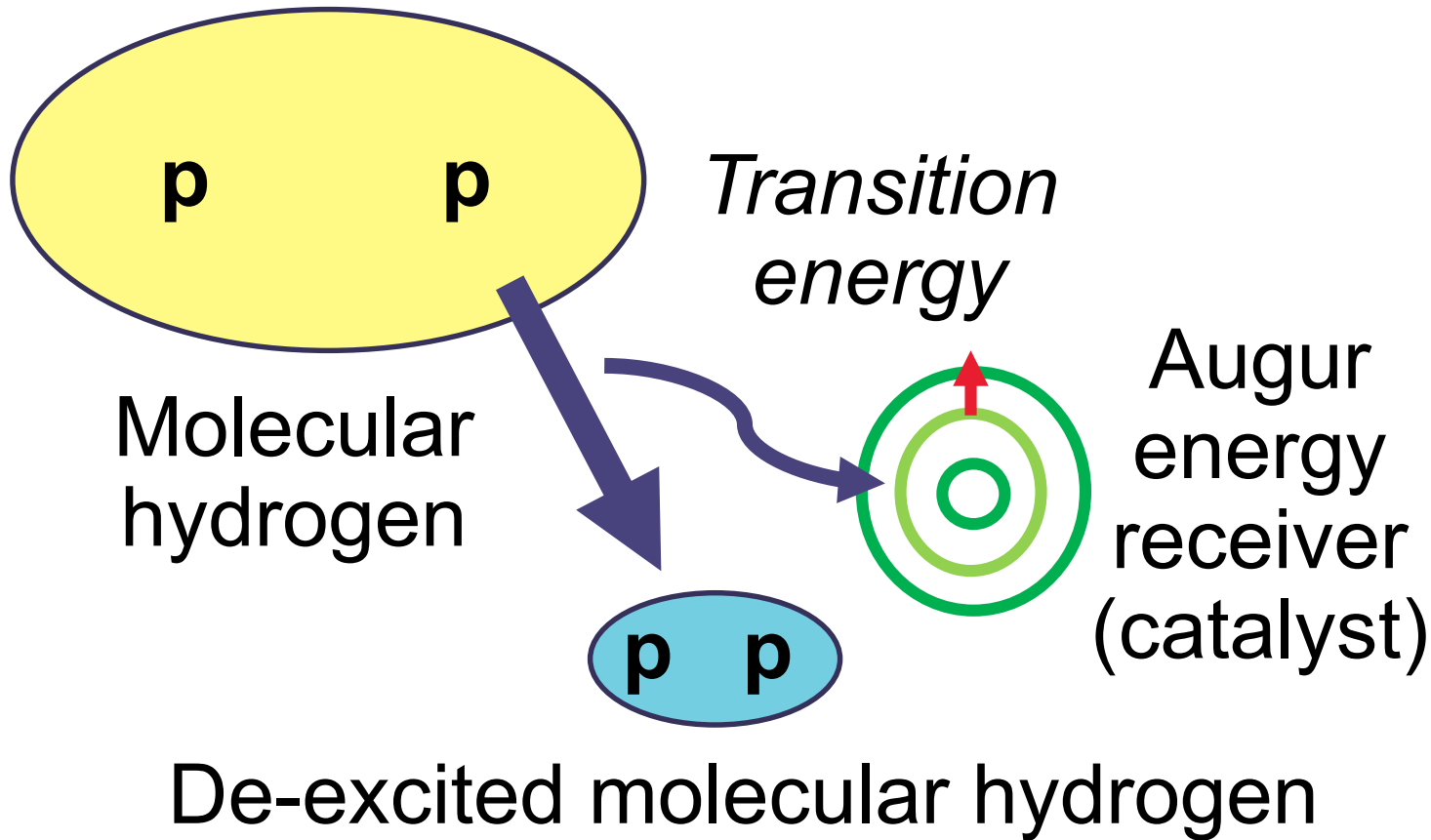
Low Energy Nuclear Reactions

H(n=1/8) catalyst: Nickel - $L_{ii}2p_{1/2} = 870.0 \text{ eV}/c^2$

Sub-Nuclear Reactions

H(n=1/6) catalyst: Tungsten - $N_{ii}4p_{1/2} = 490.4 \text{ eV}/c^2$

Dense Molecular H₂ Systems



“The new frontier”

Dense Molecular H₂ Technologies

Low energy
chemical
production of
micro-diamonds

Carbon



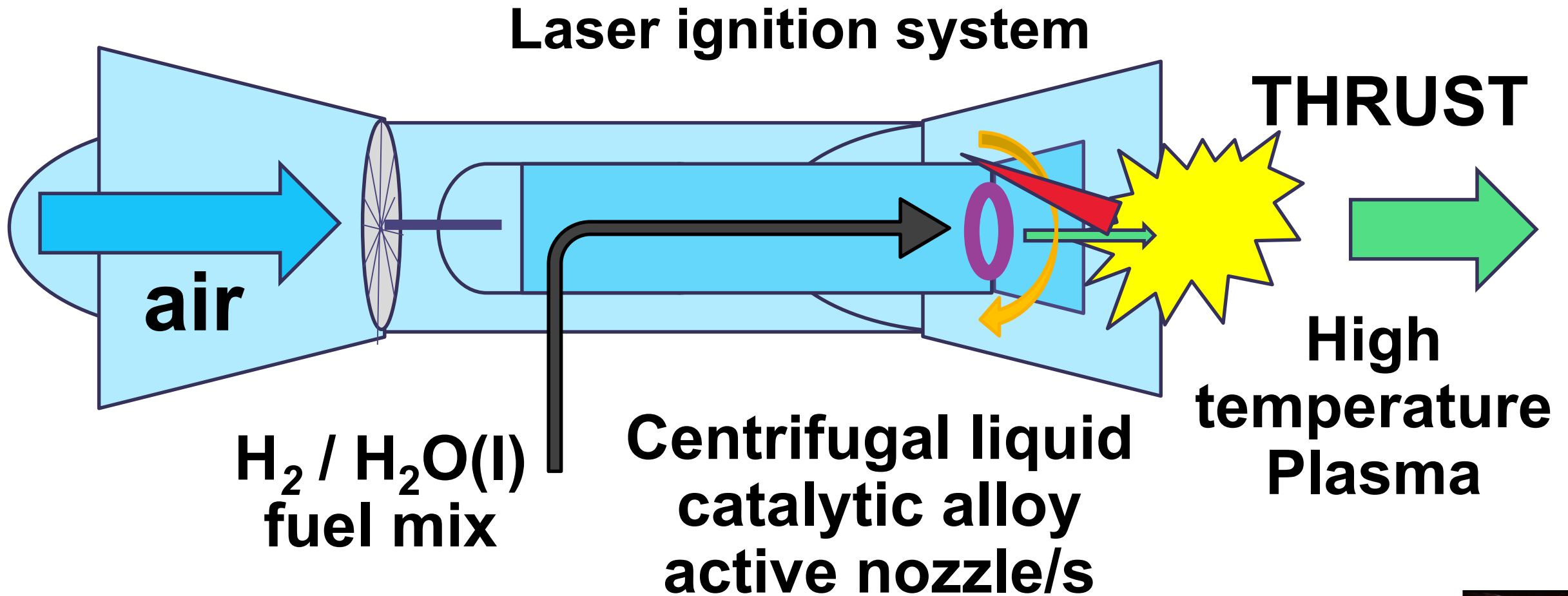
Oxygen Catalysed Dense Molecular H₂

Oxygen, K 1s, first augur energy

Infrared laser and/or secondary catalyst



Jet Propulsion System - Subtle Atomics



Extension to Expanded Hydrogen

Subtle Atomics Gas Model:

“Atomic hydrogen size varies with pressure in the gas phase”

At atmospheric pressure
H gas can expand to: **$n=4$**

Intergalactic Atomic Hydrogen

Intergalactic medium identified as:

$\sim H(n=24 \text{ to } 31)$,
Subtle Atomics, 2019

Warm to hot neutral medium transition energies consistent with Cosmic Microwave Background radiation!!!

Electron State	Rydberg Variable	Ionisation Energy	Excitation Energy	Radius	Example
	n	eV/mc ²	n to n+1 eV/mc ²	metres	
Interstellar Medium	38	0.00942223	0.0094222	7.270521	Cosmic Microwave Background source < ---- (dE/dv peak) Hot Neutral Medium (HMN) Cosmic Microwave Background source < ---- (dE/dλ peak) Warm Neutral Medium (WMN) Cold Neutral Medium (CNM)
	37	0.00993842	0.0005162	3.635260	
	36	0.01049822	0.0005598	1.817630	
	35	0.01110669	0.0006085	0.908815	
	34	0.01176963	0.0006629	0.454408	
	33	0.01249375	0.0007241	0.227204	
	32	0.01328681	0.0007931	0.113602	
	31	0.01415785	0.0008710	0.056801	
	30	0.01511744	0.0009596	0.028400	
	29	0.01617799	0.0010606	0.014200	
	28	0.01735420	0.0011762	0.007100	
	27	0.01866350	0.0013093	0.003550	
	26	0.02012670	0.0014633	0.001775	
	25	0.02176910	0.0016409	0.000888	
	24	0.02362090	0.0018479	0.000444	
23	0.02571960	0.0020917	0.000222		
22	0.02810000	0.0023913	0.000111		
21	0.03085100	0.0027410	0.000055		
20	0.03401423	0.0031623	0.000028		

~~Big Bang Theory~~



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World Engineers Convention
November 2019

