Low Energy Nuclear Reaction Research – Global Scenario

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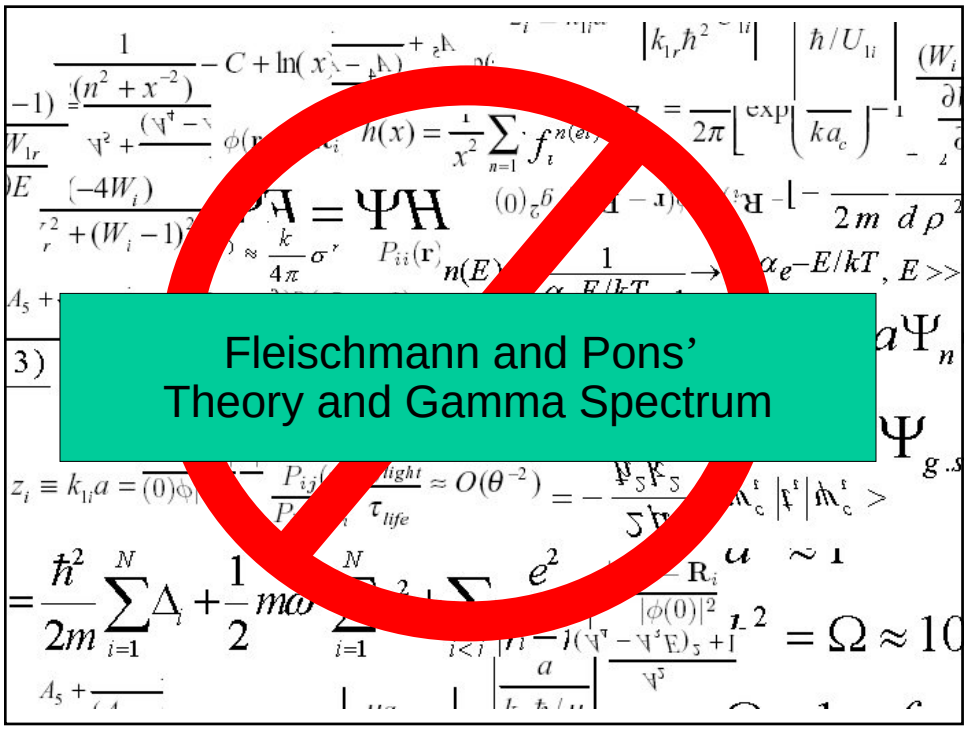
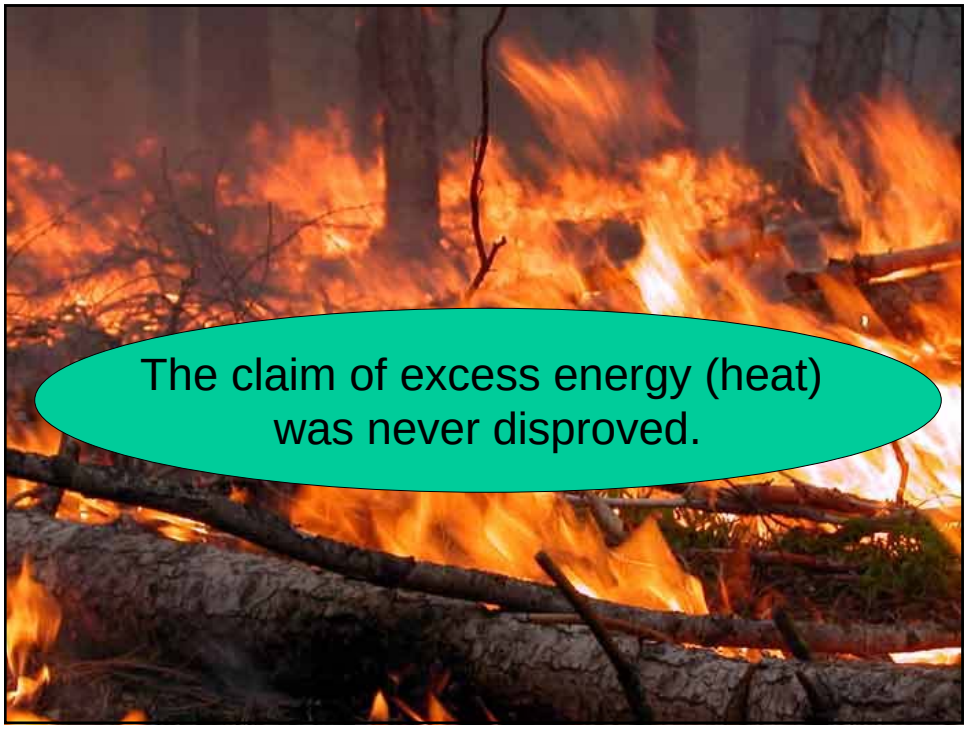
Balanced Reporting

Richard Garwin	**Moshe Gai**	**Walter Gratzer**
David Williams	**Robert Park**	**Nathan Lewis**
Steven Koonin	**Alan Bard**	**Frank Close**
William Happer		

Myth: Fleischmann and Pons were disproved





Dominant Nuclear Ash: 4He

Other products:
3He, n, transmutations, T

U.S. Navy SPAWAR San Diego Co-deposition Experiment:

Repeatable and Reproducible

Evidence of Low Energy Neutrons

Evidence of Charged Particles

Co-deposition Experiment:

Strong Evidence of Low Energy Neutrons
(March 2007 APS Meeting, Denver, CO
March 2007 ACS Meeting, Chicago, IL)
Naturwissenschaften, EPJA)

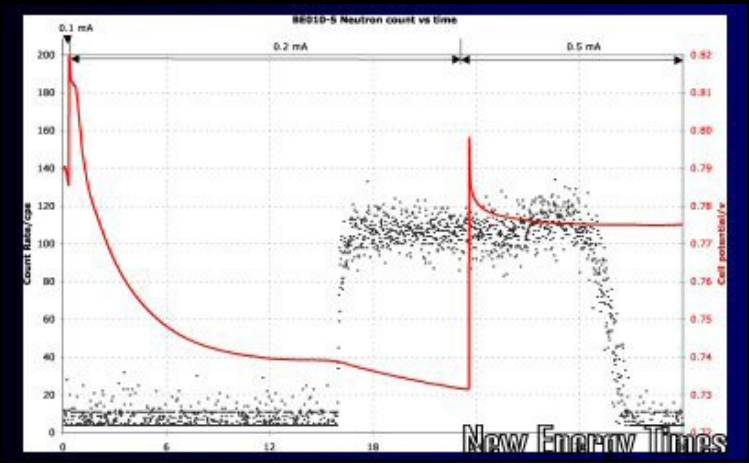
Instrument: Solid-State Nuclear Track Detectors and TASL Scanner

SRI Replication of Co-deposition Ex.

Neutron signal 14x > than background

14-hour burst (BF3)

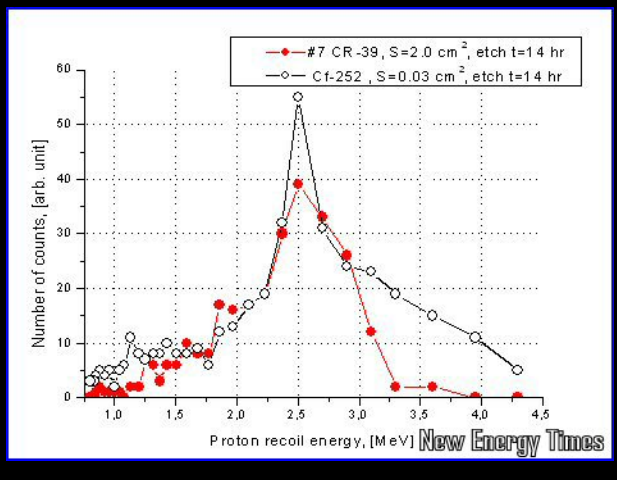
(8th Conf. on H and D/Pd Anomalies)



SRI Replication Confirmation

(RAS – A. Lipson and A. Roussetski)

Sequential Etching



Other Permanent Anomalous Evidence

Melted Metal, Vaporized Metal

Craters, Morphological Deformation

Fleischmann-Pons Effect

Excess Heat
Anomalous Nuclear Products, Emissions and Effects

Absence of Greenhouse Gases
Absence of Long-Lived Radiation
Absence of Strong Prompt Radiation

Potential Civilian Applications

Heating
Electricity
Desalinization

Potential Military Applications

Tritium Production
Neutron Production
Rapid Energy Release?

Two Groups of Theories

Heat+4He (~D/Pd)
Transmutation (D/Pd and Ni/H)

Fusion Theories

D+D
D+D+D
D+D+D+D

"New" Physics
Incomplete Math

DD Thermonuclear Fusion

D+D > **3He** (0.82 MeV) + **n** (2.45 MeV)
D+D > **T** (1.01 MeV) + **p** (3.02 MeV)

D+D > **4He** (0.08 MeV) + **gamma ray** (23.77 MeV)

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LENR Experiments

D+D > 3He + n (Energy and Ratio Unknown)
D+D > **T** + **p** (Energy and Ratio Unknown)

D+D > 4He + heat (lattice) (~12- ~48 MeV)

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n:4He = 1:1,000,000

DD Thermonuclear Fusion ≠ LENR

1. Lattice heat vs. gamma
2. Weak data showing 24 MeV reaction
3. n:T ratio does not match
4. n:4He ratio does not match

The Widom-Larsen Not-Fusion Theory

Story to publish 10 January, 2008
***New Energy Times*, Issue #26**

"Lateral Thinking"
- P.K. Iyengar

Weak Interaction Theory

Allan Widom, Northeastern University
Lewis Larsen, Pres./ CEO Lattice Energy

"Ultra Low Momentum Neutron Catalyzed Nuclear Reactions"

(1) EPJA
(3) Pre-print

No Coulomb Barrier

Claim to explain heat and helium-4
Claim to explain transmutations
Claim to explain exploding wires
Claim to explain H/Ni reactions

Other Weak Interaction Ideas and Neutron Models

Stan Szpak, SPAWAR, San Diego, US
John Fisher - US
Hideo Kozima, Tadahiko Mizuno - Japan
George Anderman, Lali Chatterjee - US

My Evaluation Process

Published Papers?
Endorsements?
Positive Critique?
Negative Critique?
Invite Debate

Debate and Critique

"Cold Fusion" Theorists

A. Takahashi
K.P. Sinha and A. Meulenberg
J. Brown
S. Chubb (NRL)
P. Hagelstein (MIT)
H. Kozima

Debate and Critique

CMNS Experimentalists and others

E. Storms
J. Dufour
R. Gimpel
B. Josephson
D. Nagel

Debate and Critique

People outside CMNS Group

D. Rees (Particle Physicist, U.S. Navy)
R. Deck (Particle Physicist, Toledo U.)

Debate and Critique

Richard Garwin

No Errors Reported

Unusual Comments

“Not fusion, but some other low energy nuclear reaction”

- Sir Arthur C. Clarke
- Robert Park

Transmutation Experiments

George Miley, UIUC
Worldwide Summary

Yasuhiro Iwamura, Mitsubishi Heavy Industries

Not Fusion Energy But…

Not 8,000,000x Chem.

Perhaps 1,000x - 100,000x Chem.

www.newenergytimes.com
www.LENR-CANR.org

New Energy Times Magazine

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