DOCUMENTATION OF COLD FUSION RESEARCH AT THE SIDNEY KIMMEL INSTITUTE FOR NUCLEAR RENAISSANCE (SKINR)

A PROJECT OF THE LENR RESEARCH DOCUMENTATION INITIATIVE

Second Draft Report. Volume 1 of 2

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March 27, 2020

Contents

1 Introduction

Cold fusion (CF) was announced in March 1989, by Dr. Martin Fleischman and Dr. Stanley Pons. The immense potential energy benefits of CF (also referred to as Low Energy Nuclear Reactions, LENR[1]) were immediately recognized. However, LENR was rejected by mainstream science within a year or so, and it remains highly marginalized to this day. On the other hand, the phenomenon has been rigorously pursued by many investigators in several countries. The mounting evidence for the reality of LENR shows that his potential benefits may yet be realized.

Because it is a "pariah" science, LENR has attracted relatively few new investigators to the field. Many of the researchers became active in the early months and years after the 1989 announcement. Now 30 years later many of these investigators are leaving the field. The results of their many years of LENR investigation are at risk of being lost, which would be unfortunate not only for the field, but also potentially for humanity. It may reasonably be argued that LENR is essential to the long-term survival of humankind as a potential inexhaustible source of cheap, clean energy.

An Initiative[2] is underway to mitigate the risk of loss of research records of LENR investigators and organizations. Its objectives are to capture, organize, document, and archive these records as well as develop a timeline of SKINR research. Previously it was performed at the Energy Institute[3] of The University of Texas at Austin (UT), and it is now being advanced at the firm LENRGY, LLC. The LENR Research Documentation Initiative (LRDI) began with a pilot project with Dr. Edmund Storms, one of the most prominent investigators in the field[4].

[1] "LENR" is used for convenience because it is well known in the field. It is recognized that the term necessarily accurately describes the phenomenon, because the mechanism is not yet known.

[2] Collection, Organization, and Documentation of LENR Research Results ("LENR Research Documentation Initiative"). Guideline, January 2019.

[3] https://energy.utexas.edu

[4] Documentation of Dr. Edmund Storms' 29 Years of Cold Fusion Research - Experiments, Explanations, and Related Scientific Contributions: Lessons Learned for Long-Term LENR Researchers. Paper Prepared for the 21st International Conference on Cold Fusion (ICCF-21), June 2018.

The Sidney Kimmel Institute for Nuclear Renaissance (SKINR) was a LENR research organization at the University of Missouri that operated for over five years (April 2012 to December 2017). SKINR employed most of the experimental methods known to achieve LENR utilizing sophisticated equipment and advanced methods. The research results were published in many papers, presentations, and other public venues. A large volume of hard-copy and electronic files containing experimental results, reports, images, and other LENR-related files was also developed.

When the organization ceased operations in December 2017, one of the researchers, Dr. Dennis Pease, purchased much of the equipment and most of files of SKINR. Starting with discussions between Dr. Pease and Dr. Thomas Grimshaw at the 21st International Conference on Cold Fusion (ICCF-21, June 2018), a project is being performed under the umbrella of the LRDI to secure the SKINR research materials. Dr. Arik El-Boher, former Research Group Leader, and Dr. Graham Huber, former SKINR Director, have joined the SKINR Research Documentation Project (SLRDP).

This second draft report is organized to first describe the SKINR organization and participants in the project, which includes interviews conducted for the SLRDP. Descriptions are given of the components of the research record found – reports and similar documents, internal annual reports, lab procedures, electronic files, and hard-copy records. The methods used in the project are covered, and future opportunities are identified. Memos were used to record the findings as progress was made. A folder on Dropbox has been set up to store the Project documents. More information on how the MLRDP is being conducted is in Section 10. The report consists of Volume 1 for the main text and Volume 2 for the appendices.

The Anthropocene Institute is acknowledged for providing financial assistance for the LRDI.

2 SKINR Overview

SKINR was initiated in April 2012 at the University of Missouri by Dr. Rob Duncan, Vice Chancellor for Research. It was formed from a preceding entity, Energetics Technologies (ET) USA, which in turn was preceded by ET Israel. It was started with a grant of $5.5 million from Sidney Kimmel, who had previously been a supporter of ET. More information on ET is provided in Section 2.3 below.

SKINR was well described in several sources during its existence[5,6,7,]. Copies of many of the descriptions are in Appendix A. In addition, Graham Hubler has provided a collection of electronic files entitled "WebSITE" [8]. He indicated the files were prepared as a potential website for SKINR but were not used for that purpose. The WebSITE collection includes about 60 files, mostly in PowerPoint (Figure 2-1). They are included in the collection of SLRDP records.

The term "anomalous heat effect" (AHE) was used as a more general term than LENR. The organization's mission was as follows:

> To find the origin of the Anomalous Heat Affect (AHE) with a sound materials science approach and with no preconceptions as to the origin of the phenomenon. To publish findings in the open literature and to openly collaborate world wide with researchers in the field and in cross disciplines.

Much of SKINR's research included superwave stimulation in the experiments, which was the basis of ET's initiation in Israel as described below (Section 2.4).

[5] El-Boher, A., 2013. Sidney Kimmel Institute for Nuclear Renaissance (SKINR) Overview – Progress Toward Understanding AHE. Presentation at the CF/LANR Colloquium, MIT, Cambridge, MA.

[6] Hubler, G.K., et al., 2015. Sidney Kimmel Institute for Nuclear Renaissance. Current Science, v. 108, no. 4, p. 562-564 + Supplemental Information Online.

[7] Hubler, G.K., et al., 2016. Overview of the Sidney Kimmel Institute for Nuclear Renaissance (SKINR). Infinite Energy, Issue 126. November.

[8] "SKINR WebSite Files from Graham Hubler". Memo to SKINR Participants from Tom Grimshaw, January 18, 2020.

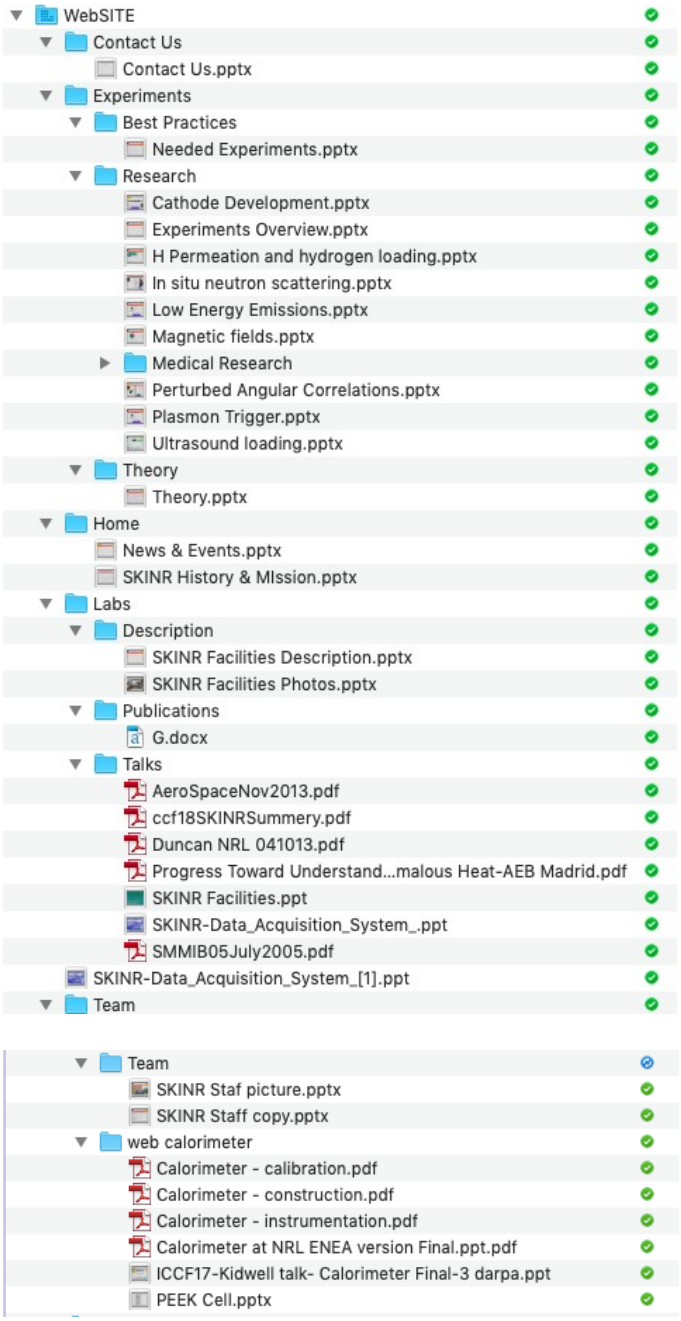

Figure 2-1. Collection of WebSITE Folders and Files

2.1 Laboratory Operations

The operations of the SKINR lab are described in the sources referenced above. The observations and experiments considered at SKINR to be important (not all of which could be pursued) were as follows:

- Nuclear Mechanism
- General Mechanism
- Solid State Theory
- Cathode Development (Many Choices)
- High Temperature Gas Loading of Ni-H System
- Facts that Support Generation of Excess Heat
- Facts that Do Not Support Nuclear Model
- Facts Describing Foil Cathode Surface

The primary methods used to investigate LENR were electrochemical cell (EC), glow discharge (GD), and gas loading:

Electrochemical Systems
- 9 open/hybrid cells in isoperibolic calorimeters
- 1 closed cell differential isoperibolic TEM calorimeter
- 2 closed cell as a parabolic TEM calorimeters
- 2 open cell mass flow calorimeters (MFC) with ultrasound stimulation
- 1 open testing cell, no calorimetry
- 2 open cells with thin membrane, no calorimetry
- 1 dual electrochemical cell hydrogen permeation system
- 3 SS closed cell mass flow kilometers
- 1 laser triggering cell with calorimetry on loaded cathode
- 1 cell allowing stress on loaded cathode
- 1 Gorski Effect cell

Glow Discharge
- 2 Pd-D2 low temperature ion bombardment with MFC
- 1 Ni-H2 high temperature ion bombardment with MFC

Gas Systems
- 1 high temperature gas reactor with mass flow calorimetry

All systems were equipped with National Instruments data collection and control hardware and LabVIEW.

The diagnostic systems used were X-ray, gamma ray, and neutron detection as well as RF spectrum analyzers (1kHz to 13 GHz). Fabrication of materials was accomplished at SKINR and at two departments at the University as shown below.

SKINR
- 2 annealing ovens
- 2 rollers
- Alloy fabrication
- 2 glow discharge cathode etching reactors

Department of Radiology (Dr. K. Kattie)
- Nanoparticle suspensions for in-situ deposition on cathode

Electrical & Computer Engineering (Dr. S. Gangopadhyay)
- Thin-film deposition
- CNT composites
- Nanoparticle fabrication and deposition
- Lithographically defined micro- & nano-structures
- Electrodeposition
- Graphene

Materials characterization was accomplished with the following:

- Scanning Electron Microscope (SEM)
- Power Spectral Density
- Atomic Force Analysis (AFM)
- X-Ray Diffraction
- X-Ray Texture
- Electrochemical Impedance Spectroscopy
- Hydrogen Permeation
- Charging Protocols

SKINR continued many of the experimental approaches of its predecessor, ET, and expanded the scope of investigations as well. Initiatives pursued are shown below.

- Electrolytic Cells
  - Cathode Development (Many Choices)
    - Self Assembled Pd Nanoparticle Cathodes
    - Pd Coated Carbon Nanotube Cathodes
    - Artificially Structured Pd Cathodes
    - Artificially
    - New Alloy Compositions
    - Dealloying for Nanoporous Pd
  - Magnetic Fields
  - In-situ Ultrasound Surface Stimulation
  - Glow Discharge Etching
  - Hydrogen Permeation Kinetics
  - Radiation Detection (Thin Membrane)
- Gas Reactors
  - Celani Replication
  - High Temperature Reactor/Calorimeter
- Related Studies
  - Exploding PdD Wires (with SRI)
  - Neutron Scattering In-situ of Pd Loading with D/H
  - MeV and keV Bombardment of D on Pd
  - Thermal Shock of TiD2
  - Hydrogen Absorption Thermodynamics at High-Pressure/Temperature
  - Diamond Radiation Detectors
  - Theory

2.2 Reported Successes of the Anomalous Heat Effect

SKINR described its most energetic AHE events as shown below:

	US1-15	US3-05	US3-06	US3-21
Excess Energy (MJ)	0.19	1.1	1.32	0.026
Excess Power (W)	0.25	0.8	0.9	0.13
Maximum COP[9]	600	3000	525	650
Excess Heat Duration (hr)	280	960	445	55

The most energetic experiments reported for ET, SKINR's predecessor, were:

	56 (EC)[10]	64a (EC)	64b (EC)	GD[11]-141
Excess Energy (MJ)	3.1	1.1	>3.5	2.4
Excess Power (W)	3	19	>11	14
Maximum COP	80	2500	>1500	75
Excess Heat Duration (hr)	300	17	80	90

2.3 Management, Staff, and Facilities

Dr. Duncan served as SKINR Director through 2013, followed by Dr. Graham Hubler, who held the position until the organization ceased operations in 2017. Arik El-Boher was Research Group Leader. The SKINR staff were as follows:

Orchideh Azizi, Ph.D., Electrochemist

JingHao He, Ph.D., Materials Scientist

Dennis Pease, Ph.D., Physicist

William Isaacson, Technician

About 20 faculty, graduate students, and post-doctoral students conducted SKINR-sponsored research. A key strategy of Dr. Duncan was to involve a number of University collaborators. They included the following:

John Gahl, Electrical Engineering: Pd, Ni on cyclotron; exploding wires.

Shubhra Gangopadhyay, Electrical Engineering: carbon nanotubes; nano-porous; artificially structured cathodes; Pd deposition on membranes.

[9] Coefficient of Performance (Pout/Pin)

[10] Electrolytic Cell

[11] Glow Discharge

Helmut Kaiser, Department of Physics and Astronomy: neutron scattering on PdD; PdH.

Kattesh Kattie, Department of Radiology: in-situ nanoparticle deposition on cathodes.

Scot Kovaleski, Electrical Engineering: piezoelectric ion sources; low energy ion bombardment.

Peter Pfeifer, Department of Physics and Astronomy: fundamental hydrogen charging of metals studies.

Mark Prelas, Nuclear Engineering: Neutrons from thermally shocked TiDx; diamond particle detectors.

A collaborative research approach was also used with several entities outside the University, including the following[12]:

SRI International
Italy's ENEA
Naval Research Lab
Coolescence
Re-Research
Aerospace Corporation

SKINR's facilities were at two locations on the University campus, one in the electrical engineering building, which emphasized electrolytic cells, and the other in the physics building, where the primary focus was on gas discharge and gas loading. The lab space in the electrical engineering is shown in Figures 2-2 to 2-5[13], which includes labels of the functions and equipment. A similar photo for the lab in the physics building is in Figure 2-6.

[12] One additional confidential collaborator is not listed.

[13] El-Boher, A., 2013. Sidney Kimmel Institute for Nuclear Renaissance (SKINR) Overview – Progress Toward Understanding AHE. Presentation in Unknown Venue.

Figure 2-2. Electrical Engineering Room 135. Sample Preparation

Figure 2-3. Electrical Engineering Room 137. Electrolytic Cell Experiments – Ultrasound Excitation

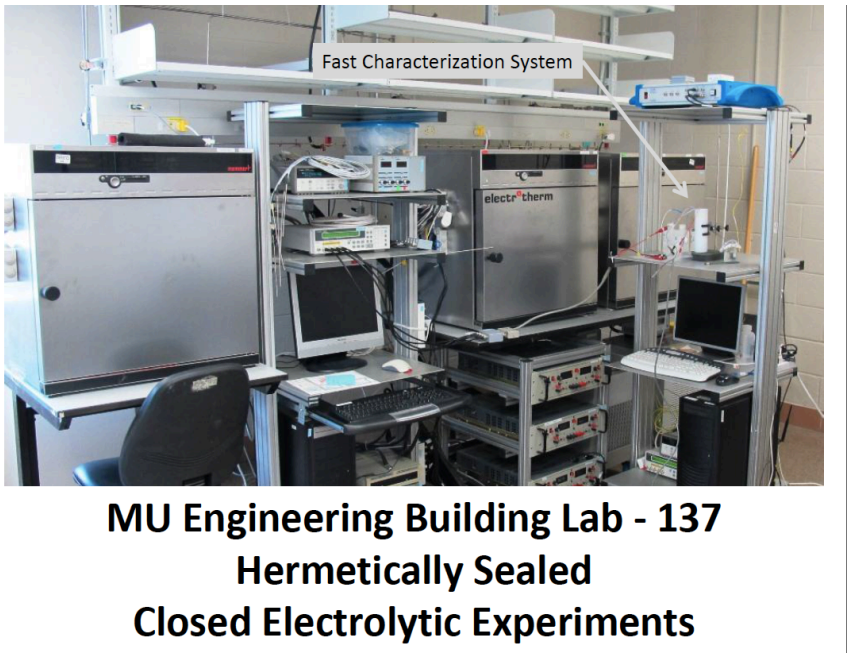

Figure 2-4. Electrical Engineering Room 137. Electrolytic Cell Experiments: Closed Cells

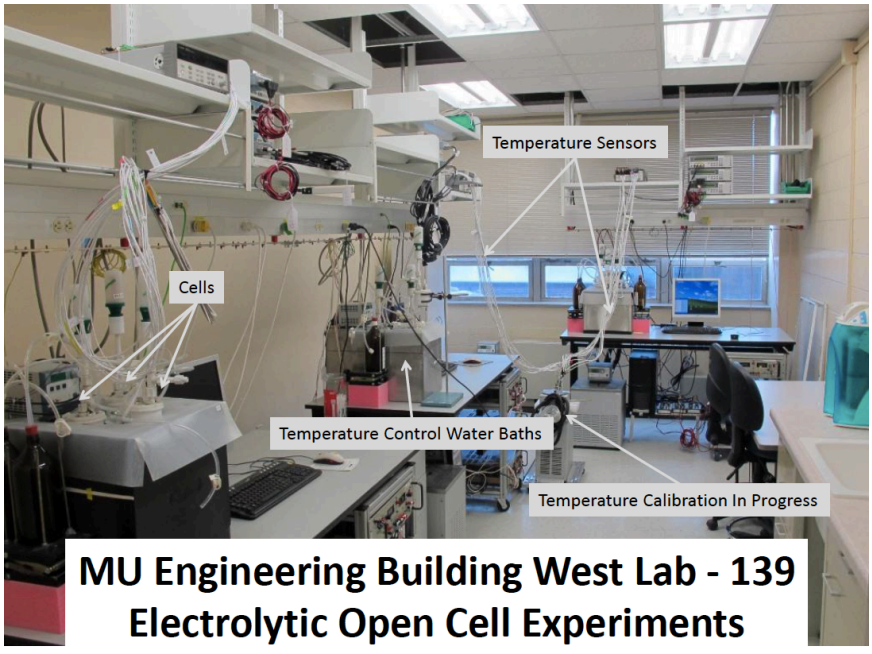

Figure 2-5. Electrical Engineering Room 139. Electrolytic Cell Experiments: Open Cells

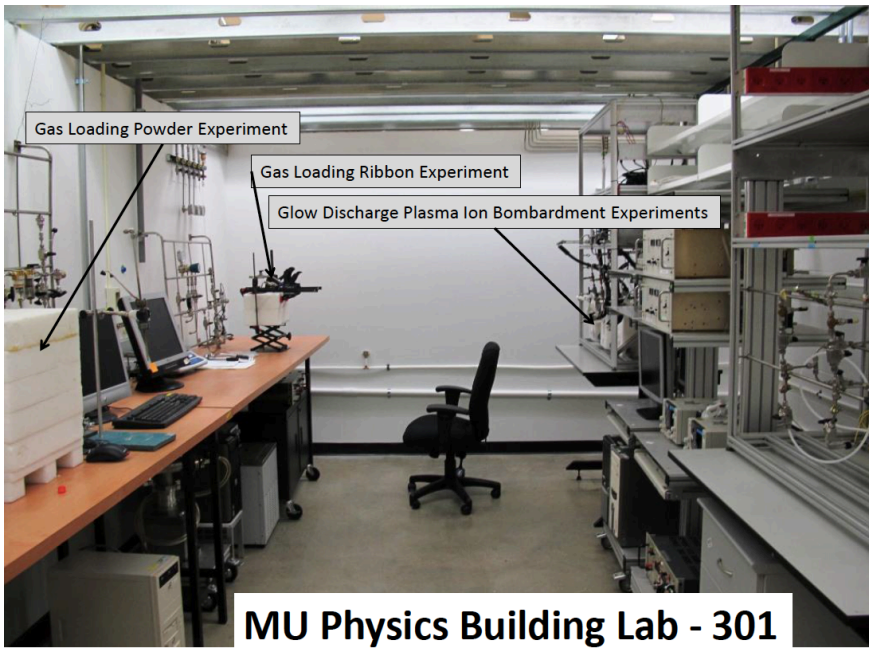

Figure 2-6. Physics Room 301. Gas Loading and Gas Discharge Experiments

2.4 SKINR's Origins: Energetics Technologies

As noted above, SKINR began its LENR work in April 2012. It was preceded by Energetics Tchnologies in the U.S. and Israel. The approximate periods of operation of ET Israel, ET USA, and SKINR are summarized by Dr. El-Boher as follows:

Energetics Technologies Israel	September 2002 to June 2010
Energetics Technologies USA	July 2010 to March 2012
SKINR	April 2012 to December 2017

ET was apparently the brainchild of Irving Dardik, we had developed and deployed a technology he referred to as "superwave" (SW). Dr. Dardik had initially employed the technology in medical applications and subsequently became interested in seeing if it would be effective in achieving LENR. The following description of Dr. Dardik is from Wikipedia[14].

> Irving Israel Dardik is a former vascular surgeon who taught at Albert Einstein College of Medicine and founded the Sports Medicine Council of the US Olympic Committee. Dardik is notable as being among the first medical doctors to officially recognize the value of chiropractic in sport, when he recommended in 1979 that the United States Olympic Committee include a Doctor of Chiropractic (D.C.) as a member of its

[14] https://en.wikipedia.org/wiki/Irving_Dardik.

> medical team at all future Olympic Games. Dardik developed a system of treating diseases using wave form technology, which he called "supersonant waveenergy". In 2004, Dardik put his waveenergy theory to use attempting to produce cold fusion. Working with Israeli company Energetics Technologies, his group claimed "startling results." Energetics Technologies is currently set up at the Business Incubator of the University of Missouri.

One of Dr. Dardik's patients, Sidney Kimmel, also became interested and agreed to provide funding to investigate the new SW application at a location in Omer, Israel, which is near Beersheba. The following description of Sidney Kimmel is derived from Wikipedia[15].

> Sidney J. Kimmel (born January 16, 1928) is an American businessman, philanthropist, and film producer. He is ranked number 655 in the Forbes list of the richest people alive in 2010. Kimmel founded Jones Apparel Group in 1970 while working at W. R. Grace and Company. Five years later, he purchased the company with a partner. Notable lines produced by Kimmel include Jones New York, Evan-Picone, and West; he also has licensing deals with Ralph Lauren. He owns art, real estate, a film production company Sidney Kimmel Entertainment, and a small stake in the professional NBA basketball team Miami Heat.
>
> Kimmel has given $5.5 million to the University of Missouri to create the Sidney Kimmel Institute for Nuclear Renaissance, SKINR, where researchers will "figure out why excess heat has been observed when hydrogen or deuterium interacts with materials such as palladium, nickel or platinum under extreme conditions.", Originally named "cold fusion," nowadays the name low-energy nuclear reaction (LENR) is also used.

An associate of Dr. Dardik, Dr. Herman Branover, assisted with the initiative, which became known as Energetics Technologies. Dr. Branover, in turn, invited Dr. Arik El-Boher, his former student at Ben-Gurion University and long-time associate (particularly in magnetohydrodynamics) in several technological start up firms, to participate. ET began operations in September 2002 with Dardik as CEO and El-Boher as Deputy CEO. ET's electrolytic cell experiments were based on the concepts of Fleischmann and Pons but were conducted in cells of their own design, primarily by Dr. El-Boher. The experiments were numbered sequentially.

In 2003, ET achieved remarkably successful LENR results in experiment (cell) #64. This experiment is widely regarded as one of the most successful and dramatic LENR events in the field. Sometime later, experiments were started using the gas discharge and gas loading methods. With the success of #64, ET sought to engage other entities in the effort. Funding was secured from DARPA for verification of ET's results by SRI International and ENEA in Italy. In a

[15] https://en.wikipedia.org/wiki/Sidney_Kimmel.

second phase of the DARPA project, the Naval Research Laboratory was included in the verification.

In a further effort to take advantage of their success, ET contacted news organizations. CBS News became interested and engaged a physicist, Dr. Rob Duncan, to examine the operations and results of ET at their lab in Omer, Israel. After the examination, Dr. Duncan indicated that he believed that ET's results were legitimate. A CBS News "60 Minutes" program ("Cold Fusion Is Hot Again"), which ran on April 19, 2008, featured Dr. Duncan as well as Dr. Michael McKubre at SRI International describing the LENR phenomenon.

Subsequently, Dr. Duncan, then Vice President of Research at the University of Missouri, worked with Sidney Kimmel to bring ET to Columbia, Missouri to secure the advantages of a US location. In 2010 ET moved from Israel to a business incubator located in Columbia near the University. Seven of the 35 ET staff moved to Columbia with the lab. ET USA operated in the incubator for about two years. Discussions between Dr. Duncan and Sidney Kimmel then led to the decision to transfer ET to the University as SKINR.

3 Project Participants: Background and Interviews

As noted in the Introduction, the main participants in the SLRDP are Dr. Dennis Pease, Dr. Arik El-Boher (Figure 3-1), and Dr. Graham Hubler. The Project was initiated with Dr. Pease, and it was subsequently joined by Dr. El-Boher[16] and Dr. Graham Hubler, former Director. Interviews have been conducted with the participants, and professional resumes have been provided by Drs. Pease and El-Boher (Appendix B). Summaries of the biographies and interviews are shown below. Transcripts of the interviews are in Appendix C.

Figure 3-1
Dennis Pease (Left) and Arik El-Boher
Dennis is outside his home in Columbia. Arik is near the travel trailer he and his wife are using for touring the U.S. Photos taken December and January 2019.

[16] "Proposed Participation in the SKINR LENR Research Documentation Project". Memo to Arik El-Boher from Tom Grimshaw, December 3, 2018.

3.1.1 Dennis Pease Biography and Interview

Dennis Pease obtained a BS degree in Physics from the University of Missouri, Rolla, and he received the MA and PhD degrees, also in Physics, at The University of Texas at Austin. He began his professional career with post-doctoral assignments at Texas Tech University and at Los Alamos National Laboratory.

He then held positions as Senior Experimental Engineer and Senior System Systems Engineer, during which he was engaged in advanced research related to re-entry vehicles, supersonic gas jets, modeling survivability systems, and hemispherical resonating gyroscopes (HRGs). Thereafter, much of Dr. Pease's work was in HRG R&D. For example, he developed a Fortran simulation of helium diffusion in fused silica for HRG development. He also performed detailed helium simulations for the HRG units for the Cassini spacecraft, which was launched in 1997 or exploration of Saturn and its rings and satellites.

Dr. Pease is the sole proprietor of the firm OptVac, which has provided consultant services in several areas, including funding for development of an inertial measurement and timing module for DARPA. He designed and built an ultra-high vacuum system for testing and analysis of low-cost infrared detectors.

He began his career at SKINR as a research scientist when the organization was formed in 2012. He served as a member of a multi-disciplinary team of professional researchers (and students) studying the origins of the AHE using electrolytic, high-temperature, and high-pressure gas loading cells. He participated in the design and troubleshooting of experiments, and he authored (and provided editorial review of) SKINR papers.

Dr. Pease innovated automated x-ray and RF spectral AHE tests that included hardware and software design with continuous (24/7) digital data collection. He supported SKINR's LabVIEW assets, including legacy versions (V6 and V7), and he authored "next generation" VI text editors (V12, V13, V14) that enabled high-speed automated data collection with high bandwidth simultaneous recording. At the conclusion of SKINR operations, Dr. Pease acquired most of the organization's assets for his home laboratory.

In his interview for the SLRDP[17] (transcript in Appendix C), Dr. Pease indicated that he began his work with SKINR as it made its transition from Energetics Technologies at the business incubator to the electrical engineering and physics buildings at the University. He covered the following regarding his role at SKINR.

- Played a major role in moving and setting up experiments; initial work was then with the ultrasound electrolytic cells, which were using superwave as well as ultrasound for cathode stimulation to produce LENR
- Worked on electrolytic cells designed for observation of x-rays through a thin membrane
- Was involved with the "NRL cells", which used RF both for stimulation and as a LENR signature
- Developed LabVIEW programs and applications for experiments that he was both directly and indirectly involved with, including programs for rapid data acquisition at SKINR
- Provided LabVIEW support for an effort to investigate superconductivity of deuterium-loaded palladium and its possible relationship to LENR
- Described several types of experiments, including the six open electrolytic cells, thermoelectric cells, the attempts to replicate Francesco Celani's experiment using Constantan wires, cells to investigate the Gorski effect, and neutron emissions from a hydrogen-loaded titanium compound.
- Described other experiments that involved a novel kind of fluorescence, addition of nanoparticles to electrolytic solutions in LENR cells and an unsuccessful plan to use neutron scattering at the Missouri University Research Reactor.
- Mentioned an experiment in collaboration with CERN, laser stimulation concepts (from Letts and Cravens), a miniature electrolytic experiment, and gas loading
- Characterized the roles and responsibilities of SKINR staff, collaborating professors and students, including managers Duncan, Hubler, and El-Boher. Others included in the descriptions were Isaacson, Azizi, Tsirlin, He, DiStefano, Norgaard, Prelas, Gangopadhyay, Kattie, and Kaiser

Dr. Pease briefly described the SKINR records that may be included in the SLRDP as well as his interest in future LENR experiments at his home lab. The last portion of the interview covered his professional biography going back to his pre-college successes in science that included building an astronomical observatory with two telescopes near his hometown of Vandalia, Missouri.

3.1.2 Arik El-Boher Biography and Interview

Arik El-Boher received his BSc as well as his MSc and PhD degrees in Mechanical Engineering at Ben-Gurion University, Beersheba, Israel. His graduate work and much of his early professional career was in the field at magnetohydrodynamics (MHD). He founded several

[17] "Review of SKINR Interviews". Memo to Dennis Pease from Tom Grimshaw, January 13, 2019.

companies in Israel for MHD applications (including pumpable ice), sapphire monocrystal growth and utilization, and microgravity casting of metallic composite materials.

Dr. El-Boher began his work in LENR in 2002 as a cofounder and deputy to the CEO of Energetics Technologies (ET). He was directly responsible for the glow discharge research program. When ET moved to Columbia, Missouri in 2010, he continued his position as deputy to the CEO. He also had responsibility for the LENR research program and operations, and was again directly responsible for the glow discharge program. In 2012, when ET transitioned to SKINR, he continued to have responsibility for the multi-disciplinary LENR program.

During his long history in conducting and directing LENR research, Dr. El-Boher gained experience in several aspects of the field:

- Open and closed helium-tight electrolytic cells
- High-temperature gas loading cells
- Plasma-ion bombarding glow discharge cells
- Accurate isoperibolic, thermoelectric, and mass flow calorimetry.

He developed effective procedures for hydrogen loading of palladium cathodes/targets using direct current, pulses, and superwaves. The targets were caused to manifest LENR using ultrasound/acoustic waves, RF waves, and magnetic pulses. Dr. El-Boher achieved LENR success as indicated by the excess heat signature many times while at ET and SKINR.

In his interview for the SLRDP[18,19] (Appendix C), Dr. El-Boher covered the following topics:

- Irving Dardik's superwave background and his desire to try the technology on LENR
- The relationship between Dardik and Sidney Kimmel that led to the funding for the attempt
- The resulting origins of Energetics Technologies (ET) in Omer, Israel in September 2002 with Dr. El-Boher as deputy CEO
- Dr. El-Boher's responsibilities for LENR cell design based on electrolytic cells concepts of Fleischmann and Pons
- The nine electrolytic cells run in parallel (later referred to by Dr. Graham Hubler as "horse cells")
- The dramatic LENR success of Experiment #64 in 2003
- The addition of the below discharge and gas loading methods to the initial electrolytic cell design

[18] "Review of SKINR Interviews". Memo to Arik El-Boher from Tom Grimshaw, January 13, 2019.

[19] "Arik El-Boher SKINR Interviews Reviewed by Arik". Memo to Arik El-Boher from Tom Grimshaw, January 22, 2019.

- The visit to ET labs by Rob Duncan arranged by 60 Minutes and his affirmation of excess heat observations
- The two-phase program, funded by DARPA, with SRI International, Italy's ENEA, and Naval Research Laboratory to confirm ET's observations
- ET's efforts to publicize their LENR success and the response of CBS News' "60 Minutes" program
- The 60 Minutes segment on LENR, "Cold Fusion Is Hot Again"
- Success in getting offers of $50 million investments from two sources, which were declined by Kimmel (preferring to continue funding on his own)
- Arrangements made between Robert Duncan and Sydney Kimmel for ET to move to a business incubator in Columbia, near the University of Missouri
- The transfer to Columbia in 2011
- The decision of Kimmel to change funding ET's research to a university to enable more in-depth and sophisticated research in an academic setting
- The subsequent moves of ET USA to the University as SKINR, with a grant of $5.5 million for five years of operation
- The three-prong approach of LENR research with SKINR staff, with University staff, and with other entities (e.g. SRI International, ENEA, Coolescence)
- Continuation of the nine "horse" cells, with changes in stimulation (ultrasound waves) and type of calorimetry in some of the cells
- The achievement of 20% reproducibility with the horse cells modified for ultrasound stimulation
- The many LENR research methods, cell designs, types of stimulation (dynamics), signature detection (diagnostic systems), and equipment used at SKINR
- The extension of SKINR operations from the summer to December 2017 by a grant, matched by Kimmel, from a confidential source
- The types of experiments performed with each of the University collaborators, including Mark Prelas, John Gahl, Kattesh Kattie, Shubrah Gangopadhyay, and Helmut Kaiser
- Initiatives to replicate the experiments of other researchers, including Francesco Celani, Alexander Parkhomov, Andrea Rossi, Dennis Letts, and Dennis Cravens
- Collaborative work with other entities, including SRI International, ENEA, Coolescence, and others
- A brief description of Graham Hubler's ideas for heat events being triggered by axions (dark matter) at a specific frequency
- The proliferation of theories for LENR, many of which are conflicting

Dr. El-Boher expressed confidence that LENR is real, but is not certain that it is a nuclear phenomenon. Future research should concentrate on excitation methods, such as laser, electrolytic electromagnetic, and especially RF (or a combination of methods). Material (palladium) properties are important, but are very complex (large parameter space

Near the end of the interview, Dr. El-Boher described his attempts to demonstrate LENR to Google to ensure funding for continued operation, but without success.

4 Publicly-Available and Project Documents

SKINR staff prepared many reports, presentations, and other documents to communicate the results of their investigations. The documents have been located in two websites in the public realm and in two sources in Project files. The four sources are shown below with the approximate number of items found in each.

Publicly Available	Items
LENR-CANR.org[20]	51
ResearchGate.net[21]	96
Project Files	
Annual Progress Reports[22]	26
Contributed by Dr. Arik El-Boher[23,24,25]	78
Total	251

The items from each of the sources are listed in Tables 4-1 to 4-4. The collection includes documents produced by staff of both SKINR and its predecessor, Energetics Technologies. There is considerable overlap of coverage of items among the four sources, and some of the items found are for work by the authors that is not related to SKINR activities. The electronic files of the items are assembled in the Project Dropbox folder. The different types of files (PDF, Word, presentations) contributed by Dr. El-Boher (Table 4-4) have been printed and are included in Appendix D.

[20] "Publicly-Available SKINR Documents on LENR-CANR.org". Memo to Dennis Pease and Arik El-Boher from Tom Grimshaw, April 10, 2019. Acknowledgement is extended to Jed Rothwell for maintaining this valuable website for the LENR field.

[21] "Publicly-Available SKINR Documents on ResearchGate.net". Memo to Dennis Pease and Arik El-Boher from Tom Grimshaw, April 11, 2019.

[22] "Reports Noted in SKINR Annual Progress Reports". Memo to Dennis Pease from Tom Grimshaw, April 15, 2019.

[23] "SKINR Documentation Project: Microsoft Word Files from Arik El-Boher". Memo to Dennis Pease and Arik El-Boher from Tom Grimshaw, December 18, 2018.

[24] "SKINR Documentation Project: PDF Files from Arik El-Boher". Memo to Dennis Pease and Arik El-Boher from Tom Grimshaw, December 20, 2018.

[25] "SKINR Documentation Project: Presentation Files from Arik El-Boher". Memo to Dennis Pease and Arik El-Boher from Tom Grimshaw, January 2, 2019.

Table 4-1. Publications by SKINR Staff on LENR-CANR.org

1990	Chambers, G. P.	Chambers, G.P., G.K. Hubler, and K.S. Grabowski. Search for Energetic Charged-Particle-Reaction Products During Deuterium-Charging of Metal Lattices. in Anomalous Nuclear Effects in Deuterium/Solid Systems, "AIP Conference Proceedings 228". 1990. Brigham Young Univ., Provo, UT: American Institute of Physics, New York.
1995	Chambers, G. P.	Chambers, G.P., G.K. Hubler, and Y. Kucherov, Glow Discharge in Deuterium. 1995.
2003	Dardik, I.	Dardik, I., et al. Intensification Of Low Energy Nuclear Reactions Using Superwave Excitation. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: LENR-CANR.org.
2003	Jones, S. E.	Jones, S.E., et al. Charged-particle Emissions from Metal Deuterides. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: LENR-CANR.org.
2003	Jones, S. E.	Jones, S.E., et al. Neutron Emissions from Metal Deuterides. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: LENR-CANR.org.
2003	Kenney, F.	Kenney, F., et al. Charged-particle Emissions from Deuterated Metals. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: LENR-CANR.org.
2003	Kenney, F.	Kenney, F., et al. Neutron Emissions from Deuterated Metals. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: LENR-CANR.org.
2004	Dardik, I.	Dardik, I., et al. Excess heat in electrolysis experiments at Energetics Technologies (PowerPoint slides). in Eleventh International Conference on Condensed Matter Nuclear Science. 2004. Marseille, France.
2005	Apicella, M.	Apicella, M., et al. Reproducibility of Excess of Power and Evidence of 4He in Palladium Foils Loaded with Deuterium (PowerPoint slides). in American Physical Society Meeting. 2005. Los Angeles.
2005	Dardik, I.	Dardik, I., et al. Progress in Electrolysis Experiments at Energetics Technologies (PowerPoint slides). in The 12th International Conference on Condensed Matter Nuclear Science. 2005. Yokohama, Japan.
2007	Dardik, I.	Dardik, I., et al. Report on Electrolysis Experiments at Energetics Technologies. in The 13th International Conference on Condensed Matter Nuclear Science. 2007. Sochi, Russia.
2007	Hubler, G. K.	Hubler, G.K., Anomalous Effects in Hydrogen-Charged Palladium - A review. Surf. Coatings Technol., 2007.
2007	Hubler, G. K.	Hubler, G.K., Anomalous Effects in Hydrogen-Charged Palladium - A review (PowerPoint slides). Surf. Coatings Technol., 2007.
2007	Violante, V.	Violante, V., et al. Joint Scientific Advances in Condensed Matter Nuclear Science. in Proceedings of the 8th International Workshop on Anomalies in Hydrogen / Deuterium Loaded Metals. 2007. Sicily, Italy.
2008	Dardik, I.	Dardik, I., et al. Ultrasonically-excited electrolysis Experiments at Energetics Technologies. in ICCF-14 International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC.
2008	McKubre, M. C. H.	McKubre, M.C.H., et al., Replication of Condensed Matter Heat Production, in Low-Energy Nuclear Reactions Sourcebook. 2008, American Chemical Society: Washington, DC. p. 219-247.
2008	Castagna, E.	Castagna, E., et al. Metallurgical characterization of Pd electrodes employed in calorimetric experiments under electrochemical deuterium loading. in ICCF-14 International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC.
2008	Sarto, F.	Sarto, F., et al. Electrode Surface Morphology Characterization by Atomic Force Microscopy. in ICCF-14 International Conference on Condensed Matter Nuclear

		Science. 2008. Washington, DC.
2008	Violante, V.	Violante, V., et al. Material Science on Pd-D System to Study the Occurrence of Excess Power. in ICCF-14 International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC.
2009	Knies, D.	Knies, D., et al. In Situ Energy-Dispersive X-ray Diffraction Study of Thin Pd Foil at D/Pd and H/Pd ~1 (PowerPoint slides). in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA.
2009	Knies, D.	Knies, D., et al. In Situ Energy-Dispersive X-ray Diffraction Study of Thin Pd Foils at D/Pd and H/Pd ~1. in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA.
2009	Violante, V.	Violante, V., et al. Evolution and Progress in Material Science for Studying the Fleischmann and Pons Effect (FPE). in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA.
2009	Violante, V.	Violante, V., et al. Evolution and Progress in Material Science for Studying the Fleischmann and Pons Effect (PowerPoint slides). in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA.
2012	Dominguez, D. D.	Dominguez, D.D., et al. Anomalous Results in Fleischmann-Pons Type Electrochemical Experiments (PowerPoint slides). in 17th International Conference on Cold Fusion. 2012.
2012	Dominguez, D. D.	Dominguez, D.D., et al., Are Oxide Interfaces Necessary in Fleischmann-Pons-type Experiments? J. Condensed Matter Nucl. Sci., 2012. 8.
2012	Knies, D.	Knies, D., et al., In-situ synchrotron energy-dispersive x-ray diffraction study of thin Pd foils with Pd:D and Pd:H concentrations up to 1:1. J. Appl. Phys., 2012. 112(083510).
2015	Azizi, O.	Azizi, O., et al., Progress towards understanding anomalous heat effect in metal deuterides. Curr. Sci., 2015. 108(4).
2015	Hubler, G. K.	Hubler, G.K., et al., Sidney Kimmel Institute for Nuclear Renaissance. Curr. Sci., 2015. 108(4).
2015	Violante, V.	Violante, V., et al., Review of materials science for studying the Fleischmann and Pons effect. Curr. Sci., 2015. 108(4).
2015	Azizi, O.	Azizi, O., et al., Progress towards understanding anomalous heat effect in metal deuterides. Curr. Sci., 2015. 108(4).
2015	Hubler, G. K.	Hubler, G.K., et al., Sidney Kimmel Institute for Nuclear Renaissance. Curr. Sci., 2015. 108(4).
2015	Violante, V.	Violante, V., et al., Excess Power during Electrochemical Loading: Materials, Electrochemical Conditions and Techniques. J. Condensed Matter Nucl. Sci., 2015. 15.
2015	Violante, V.	Violante, V., et al. Excess Power during Electrochemical Loading: Materials, Electrochemical Conditions and Techniques (Powerpoint Slides). in ICCF18 Conference. 2015. University of Missouri.
2015	Violante, V.	Violante, V., et al., Review of materials science for studying the Fleischmann and Pons effect. Curr. Sci., 2015. 108(4).
2015	Azizi, O.	Azizi, O., et al., Progress towards understanding anomalous heat effect in metal deuterides. Curr. Sci., 2015. 108(4).
2015	Hubler, G. K.	Hubler, G.K., et al., Sidney Kimmel Institute for Nuclear Renaissance. Curr. Sci., 2015. 108(4).
2015	Violante, V.	Violante, V., et al., Excess Power during Electrochemical Loading: Materials, Electrochemical Conditions and Techniques. J. Condensed Matter Nucl. Sci., 2015. 15.
2015	Violante, V.	Violante, V., et al. Excess Power during Electrochemical Loading: Materials, Electrochemical Conditions and Techniques (Powerpoint Slides). in ICCF18 Conference. 2015. University of Missouri.

2015	Violante, V.	Violante, V., et al., Review of materials science for studying the Fleischmann and Pons effect. Curr. Sci., 2015. 108(4).
2016	Azizi, O.	Azizi, O., et al., Effect of Cathode Pretreatment and Chemical Additives on H/D Absorption into Palladium via Electrochemical Permeation. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	El-Boher, A.	El-Boher, A., et al., Final Report on Calorimetry-based Excess Heat Trials using Celani Treated NiCuMn (Constantan) Wires. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	Pease, D.	Pease, D., et al., Search for Low-energy X-ray and Particle Emissions from an Electrochemical Cell. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	Azizi, O.	Azizi, O., et al., Effect of Cathode Pretreatment and Chemical Additives on H/D Absorption into Palladium via Electrochemical Permeation. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	El-Boher, A.	El-Boher, A., et al., Final Report on Calorimetry-based Excess Heat Trials using Celani Treated NiCuMn (Constantan) Wires. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	Pease, D.	Pease, D., et al., Search for Low-energy X-ray and Particle Emissions from an Electrochemical Cell. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	Azizi, O.	Azizi, O., et al., Effect of Cathode Pretreatment and Chemical Additives on H/D Absorption into Palladium via Electrochemical Permeation. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	El-Boher, A.	El-Boher, A., et al., Final Report on Calorimetry-based Excess Heat Trials using Celani Treated NiCuMn (Constantan) Wires. J. Condensed Matter Nucl. Sci., 2016. 19.
2016	Pease, D.	Pease, D., et al., Search for Low-energy X-ray and Particle Emissions from an Electrochemical Cell. J. Condensed Matter Nucl. Sci., 2016. 19.
2017	Bok, S.	Bok, S., et al., Fluorescence-based Temperature Sensor for Anomalous Heat from Loaded Palladium Electrodes with Deuterium or Hydrogen. J. Condensed Matter Nucl. Sci., 2017. 24: p. 25-31.
2017	Bok, S.	Bok, S., et al., Fluorescence-based Temperature Sensor for Anomalous Heat from Loaded Palladium Electrodes with Deuterium or Hydrogen. J. Condensed Matter Nucl. Sci., 2017. 24: p. 25-31.
2017	Bok, S.	Bok, S., et al., Fluorescence-based Temperature Sensor for Anomalous Heat from Loaded Palladium Electrodes with Deuterium or Hydrogen. J. Condensed Matter Nucl. Sci., 2017. 24: p. 25-31.

Table 4-2. Publications by SKINR Staff on ResearchGate.net

2003	Gazit, et al.	Intensification of low energy nuclear reactions using superwave excitation
2003	David Knies, et al.	A New Fully Integrated Amplifier and Charge-to-Time Converter Module for Ion Beam Characterization
2003	D. B. Chrisey and Graham K. Hubler	Pulsed Laser Deposition of Thin Film
2003	Steven Jones, et al.	Neutron Emissions from Metal Deuterides
2004	David Knies, et al.	Status report of the NRL TEAMS facility
2004	F. W. Keeney, et al.	Charged-Particle Emissions from Deuterided Metals
2005	Carmine Carosella and Graham K. Hubler	Bruce John Faraday
2006	I Dardik, et al.	Excess heat in electrolysis experiments at Energetics Technologies
2006	M.L. Apicella, et al.	Progress on the Study of Isotopic Composition in Metallic Thin Films Undergone to Electrochemical Loading of Hydrogen
2006	P Matic, et al.	QuadGard Arm and Leg Protection Against IED's
2006	J. H. He, et al.	Kinetic Monte Carlo simulations of nanoscale compositional patterning during film growth of phase-separated systems
2006	Misganaw Getaneh, et al.	Applications of the Microchannel Plate in Accelerator Mass Spectrometry
2006	J H He et al.	Bombardment-induced tunable superlattices in the growth of Au-Ni films.
2007	R. J. Tonucci and Graham K. Hubler	Materials Characterization and Nanofabrication Methods—Nanochannel Glass Materials
2007	J.H. He, et al.	Correlation between formation of layered nanoparticles in phase separated films and ion beam assisted deposition
2007	R. Nishimura, et al.	Hydrogen permeation behavior in polycrystalline nickel implanted with various elements
2007	Graham K. Hubler	Anomalous effects in hydrogen-charged palladium — A review
2007	Rokuro Nishimura, et al.	Hydrogen permeation behavior in pure nickel implanted with phosphorus, sulphur and their mixture
2007	V. Violante, et al.	Joint Scientific Advances in Condensed Matter Nuclear Science
2008	Michael Mckubre, et al.	Replication of Condensed Matter Heat Production
2008	I Dardik, et al.	Ultrasonically-excited electrolysis Experiments at Energetics Technologies
2008	Robert Furstenberg, et al.	Stand-off detection of trace explosives via resonant infrared photothermal imaging
2008	David R. Mott, et al.	Blast-Induced Pressure Fields Beneath a Military Helmet for Non-Lethal Threats
2008	M. Getaneh, et al.	Applications of the Microchannel Plate for Mass Spectrometry
2008	V. Violante, et al.	Calorimetric results of ENEA cooperative experiments
2008	Emanuele Castagna, et al.	Metallurgical characterization of Pd electrodes employed in calorimetric experiments under electrochemical deuterium loading
2008	V. Violante, et al.	Material Science on Pd-D System to Study the Occurrence of Excess Power
2008	Francesca Sarto, et al.	Electrode Surface Morphology Characterization by Atomic Force Microscopy
2009	J. H. He, et al.	Dynamical Structures in Phase-Separated Films Deposited under Ion Bombardment
2009	V. Violante, et al.	Evolution and progress in material science for studying the fleischmann and pons effect (FPE)
2009	David Knies, et al.	In situ energy-dispersive X-ray diffraction study of thin Pd foils at D/Pd and H/Pd ~1
2009	K. E. Simmonds, et al.	Sensor Systems for Measuring Helmet-Head-Brain Response to Blast
2010	Zilla Sinuany-Stern, et al.	A comparative economic analysis of closed integrated electric power systems

2011	T. L. Carroll and Graham K. Hubler	Direction finder for incoming gunfire
2011	Peter L. Hagelstein, et al.	Visiting Scientists and Research Affiliates
2011	Peter Matic, et al.	Extremity Armor
2011	P. Matic and Graham K. Hubler	Extremty Armor
2011	Dawn D. Dominguez, et al.	Are oxide interfaces necessary in Fleischmann-Pons-type experiments?
2011	L. D. StephensonJ. Bentley, et al.	Some Characteristics of Al12Mo in Aluminum Annealed After Implantation with Molybdenum
2011	Graham K. Hubler, et al.	Ion Beam assisted Deposition of Titanium Nitride
2011	Graham K. Hubler	Microstructural evolution during ion beam assisted Deposition
2011	E.P. Donovan, et al.	Infrared and Ion Beam Analysis of SIxN1−x Alloys Grown by Ion Beam Assisted Deposition
2011	R. H. Bassel, et al.	Collision Cascade Densification of Materials
2011	Graham K. Hubler, et al.	Physical Properties of Two Metastable States of Amorphous Silicon
2011	C.A. Carosella, et al.	Thermal Annealing Investigation of the Optical Properties of BxN1-X Films Fabricated by Ion Beam Assisted Deposition and Application for an Optical Filter
2012	Graham K. Hubler, et al.	Anomalous Energetic Proton Emission during 170 keV Deuteron Bombardment of TiD2
2012	Yan Kucherov, et al.	Blast induced mild traumatic brain injury/concussion: A physical analysis
2012	David Knies, et al.	In-situ synchrotron energy-dispersive x-ray diffraction study of thin Pd foils with Pd:D and Pd:H concentrations up to 1:1
2012	J. H. He, et al.	Hydrogen segregation and lattice reorientation in palladium hydride nanowires
2012	J.H. He, et al.	Stability of a hydrogen molecule in a vacancy of palladium hydrides
2012	R. Andrew Mcgill, et al.	Detection of chemicls with infrared light
2012	Yan Kucherov and Graham K. Hubler	Armor Plate
2012	Yan Kucherov, et al.	Acoustic waves excited by phonon decay govern the fracture of brittle materials
2012	R. Andrew Mcgill, et al.	Detection of chemicals with infrared light
2013	V. Violante, et al.	Excess of power during electrochemical loading: Materials, electrochemical conditions and techniques
2013	R. Andrew Mcgill, et al.	Analyte Detection with Infrared Light
2013	R. Andrew Mcgill, et al.	Detection of chemicals with infrared light
2013	V. Violante, et al.	Excess of power during electrochemical loading: Materials, electrochemical conditions and techniques
2014	J. Baker, et al.	Production of nanoporous palladium from a deuterium loaded wire driven by a low energy, fast pulser
2014	J. Baker, et al.	Novel calorimetry technique for pulsed wires
2014	J. Baker, et al.	Production of nanoporous palladium from a deuterium loaded wire driven by a low energy, fast pulser
2014	J. Baker, et al.	Novel calorimetry technique for pulsed wires
2014	Yan Kucherov and Graham K. Hubler	Armor plate with shock absorbing properties

2014	Yan Kucherov and Graham K. Hubler	Blast Wave Effects Reduction System
2015	Graham K. Hubler, et al., et al.	Sidney Kimmel Institute for Nuclear Renaissance
2015	O. Azizi, et al.	Progress towards understanding anomalous heat effect in metal deuterides
2015	V. Violante, et al.	Review of materials science for studying the Fleischmann and Pons effect
2015	Yan Kucheron and Graham K. Hubler	Heat dissipation system with surface located cavities for boundary layer disruption
2015	Yan Kucherov and Graham K. Hubler	Heat dissipation system with boundary layer disruption
2015	Graham K. Hubler, et al.	Sidney Kimmel Institute for Nuclear Renaissance
2015	O. Azizi, et al.	Progress towards understanding anomalous heat effect in metal deuterides
2015	V. Violante, et al.	Review of materials science for studying the Fleischmann and Pons effect
2015	Graham K. Hubler, et al.	Method and apparatus for measuring data for injury analysis
2016	Graham K. Hubler	Hyperfine Interactions in PdD and PdH
2016	Hailong Song, et al.	Linking blast physics to biological outcomes in mild traumatic brain injury: Narrative review and preliminary report of an open-field blast model
2017	Hailong Song, et al.	The behaviors and neuropathology linked with biophysics in a murine model of open-field blast- induced mild traumatic brain injury
2017	Graham K. Hubler and Joseph Aviles	Patent Application US 2017 /0323692A1 Energy generation by efficient inverse-Primakoff Effect conversion of scalar particle dark matter into photons
2017	Graham K. Hubler and Joseph Aviles	Apparatus, Systems and Methods for conversion of scalar particle flow to an electrical output
2017	Graham K. Hubler	Patent Application US2017 0323692A1 Apparatus, Systems and Methods for Conversion of Scalar Particle Flow to an Electrical Output
2018	Mei Chen, et al.	Proteomic Profiling of Mouse Brains Exposed to Blast-Induced Mild Traumatic Brain Injury Reveals Changes in Axonal Proteins and Phosphorylated Tau
2018	Hailong Song, et al.	Nanometer ultrastructural brain damage following low intensity primary blast wave exposure
2018	Hailong Song, et al.	LOW-INTENSITY PRIMARY BLAST INDUCES NANOSCALE BRAIN DAMAGE AND ASSOCIATED BEHAVIORAL IMPAIRMENTS IN MICE
2018	Hailong Song, et al.	Ultrastructural brain abnormalities and associated behavioral changes in mice after low-intensity blast exposure

Table 4-3. Publications by SKINR Staff in SKINR Annual Progress Reports

2013	Hubler, G.K.	Sidney Kimmel Institute for Nuclear Renaissance (SKINR) Overview. Presentation. ICCF-18, Columbia, MO. July.
2013	Norgard, P., et al.	Deuteron Activation of 110Pd Leading to the Production of 111Ag. Manuscript. ICCF-18 Proceedings?
2013	Violante, V., et al.	Excess of Power during Electrochemical Loading: Materials, Electrochemical Conditions and Techniques. ICCF-18 Proceedings.
2014	Baker, J., et al.	Production of Nanoporous Palladium from Deuterium Loaded Wire Driven by a Low Energy, Fast Pulser. Proceedings, IEEE International Power Modulator and High Voltage Conference.
2014	Baker, J., et al.	Novel Calorimetry Technique for Post Wires. Proceedings, IEEE International Power Modulator and High Voltage Conference.
2015	Azizi, O.	Effect of Pd Nanoparticles Codeposited on Pd on H/D Absorption and Excess Heat Generation in Electrochemical and Permeation Cells. Talk Delivered at ICCF-19, April.
2015	Azizi, O., et al.	Progress Towards Understanding Anomalous Heat Effect in Metal Deuterides. Current Science, v. 108, no. 4, p. 566-573.
2015	Baker, J., et al.	Hydrogen Effect on Creation of Nanoporous Palladium by Palladium Hydride Wire Explosion. To Be Published in Journal of Applied Physics.
2015	Baker, J., et al.	Hydrogen Effect on Creation of Nanoporous Palladium by Palladium Hydride Wire Explosion. Patent Submitted.
2015	Baker, J., et al.	Hydrogen Effect on Creation of Nanoporous Palladium by Palladium Hydride Wire Explosion. International Journal of Metallurgy and Metal Physics, v. 1, p. 2
2015	He, J.	Search for Excess Heat in Electrolysis Using Single Wall Carbon Nanotubes and Graphene Coated Palladium Cathodes. Talk Delivered at ICCF-19, April.
2015	Hubler, G.K.	On a Possible Cosmological Exclamation for the Anomalous Heat Effect. Talk Delivered at ICCF-19, April.
2015	Hubler, G.K., et al.	Sidney Kimmel Institute for Nuclear Renaissance. Current Science, v. 108, no. 4, p. 563-564.
2015	Katti, K.V., et al.	EGCG Stabilized Palladium Nanoparticles in Method for Making Same. Patent Submitted. Granted 2017.
2015	Violante V, et al.	Review of Materials Science for Studying the Fleischmann and Pons Effect. Current Science, v. 108, no. 4, p. 540-558.
2016	Azizi, O.	The Effect of Cathode Pretreatment and Chemical Additives on H/D Absorption into Palladium Via Electrochemical Permeation. ICCF-19 Proceedings. Journal Condensed Matter Nuclear Science, p. 1-9.
2016	Baker, J., et al.	Synthesis of Nanoporous Pd by Exploding PdH Nanowires. Patent Submitted.
2016	Bok, S., et al.	Florescence Based Temperature Sensor for In-Situ Sub-Micron Heat Detection on D/H-Loaded Palladium Electrode Surfaces. ICCF-20 Proceedings. Journal Condensed Matter Nuclear Science, p. 85-92.
2016	El-Boher, A., et al.	Final Report on Calorimetry-based Excess Heat Trials Using Celani or Valat Coated NiCuMn (Constantan) Wires. ICCF-19 Proceedings. Journal Condensed Matter Nuclear Science, p. 68-87.
2016	El-Boher, A., et al.	Final Report on SKINR Replication Experimental Program to Seek Excess Heat Using Ni Powders Mixed with LiAlH4 and Free Li under High Temperature Hydrogen Gas. ICCF-20 Proceedings. Journal Condensed Matter Nuclear Science, p. 297-303.
2016	He, J., et al.	Hyperfine Interactions in Palladium Foils during Deuterium/Hydrogen Electro Chemical Loading. ICCF-20 Proceedings.
2016	He, J., et al.	Hyperfine Interactions in Palladium Foils during Deuterium/Hydrogen

		Electrochemical Loading. Talk Given at Hyperfine Interactions Conference, Brussels, Belgium, November.
2016	Pease, D., et al.	Search for Low-Energy X-Ray and Particle Emissions from an Electrochemical Cell. ICCF-19 Proceedings. Journal Condensed Matter Nuclear Science, p. 257-263.
2016	Pease, D., et al.	Measurement Errors and Artifacts in AHE and LENR Experiments. ICCF-20 Proceedings. October.
2017	Azizi, O.	Effect of Mercury on the Kinetics and Mechanism of Hydrogen/Deuterium Loading into Palladium in Alkaline Solution. ICCF-20 Proceedings. Journal Condensed Matter Nuclear Science, p. 289-296.
2017	Hubler, G.K., and J. Aviles.,.	Energy Generation by Inverse-Premikov Effect Conversion of Scaler Particle Dark Matter into Photons. Patent Submitted. Final Patent to Be Published October 2018.

Table 4-4. Publications by SKINR Staff in Contributions by Dr. El-Boher

Type A = Adobe PDF, P = PowerPoint, W = Word

None	Loading of Palladium Foil in 0.1 M LiOD	Loading1.doc	W	28
2003	Intensification of Low Energy Nuclear Reactions Using Superwave Excitation	Intensification of LENR using SW Excitation ICCF 10.pdf	A	1
2003	2003 (No Title). No date.	ET-1 Presentation.ppt	P	30
2003	2003 Energetics Technologies Ltd., ET-0 Cell Design. No date.	ET0 Presentation2.ppt	P	31
2003	2003 Energetics Technologies Ltd., Superwave Superwaves Studies. Full screen (Will not print). No date.	Presentatlon1.pps	P	36
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Dardik et al., August.	Astl-Enea.ppt	P	29
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Dardik, El-Boher, Lesin. No date.	Glow Discharge.ppt	P	32
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Dardik, et al., August.	Irv's two favorite graphics.ppt	P	34
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Dardik, et al., August.	Presentation animated.ppt	P	35
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Branover, et al., August.	Tanya.Aug03.paper.ppt	P	38
2003	2003 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Branover, et al., August.	Tanya.Aug03.Poster2.ppt	P	40
2003	2003 Low Energy Nuclear Reaction Research at Energetics Technologies Ltd. Branover, et al., August.	Presentation2.ppt	P	37
2003	2003 Low Energy Nuclear Reaction Research at Energetics Technologies Ltd. Branover, et al., August.	Tanya.Aug03.Poster ppt	P	39
2003	ICCF-10 Highlights. Ehud?, August.	HIGHLIGHTS.ICCF10-Ehud.ppt	P	33
2004	Excess Heat in Electrolysis Experiments at Energetics Technologies	Dardiklexcessheat.pdf	A	2
2004	Excess Heat in Electrolysis Experiments at Energetics Technologies	ICCF 11 Presentation.pdf	A	3
2004	2004 Energetics Technologies Ltd., Excess Heat Production in Electrolytic Cell ETE-4-56, March-April 2004, Omer, Israel.	Excess Heat1.ppt	P	44
2004	2004 Energetics Technologies Structure. No date.	USA visit March2004 1.ppt	P	46
2004	2004 Excess Heat in Electrolysis Experiments at Energetics Technologies. Dardik, et al., November.	ENERGETIC· ICCF11.ppt	P	43
2004	2004 Excess Heat in Electrolysis Experiments at Energetics Technologies. Dardik, et al., November.	FRASCATI 2004.ppt	P	45
2004	2004 Experiment #64A: Excess Heat. No date.	(2015) ET # 64 a & b.pptx	P	41
2004	2004 Intensification of Low Energy Nuclear Reactions through Superwave Excitation. Dardik, et al., March.	Asti – El-Boher ppt	P	42
2005	2005 Deuterium in Palladium, Structural Transformations of Pd, Energetics Technologies Limited, 6th International Workshop on Anomalies in Hydrogen/Deuterium Loaded Metals, 13-15 May, Sienna.	ENERGETICS-2 SIENA 2005.ppt	P	47
2005	2005 Excess Heat in Electrolysis Experiments at	Sienna MayO5.ppt	P	48

	Energetics Technologies. Dardik, et al., May.			
2006	2006 Inhomogeneities of Pd Foils and Their Influence on the Structure of the Metal. No date.	Presentation-outline-ltaly-Sept-06.ppt	P	49
2006	2006 Low Energy Nuclear Reaction Research at Energetics Technologies Ltd. No date.	Rome September2006.ppt	P	51
2006	2006 Progress in Electrolysis Experiments Technologies. Dardik, et al., April.	Rome seminar2.ppt	P	50
2007	New Physical Effects in Metal Deuterides	DARPA P16816 Finals.pdf	A	4
2007	2007 Absorption of the Deuterium in Palladium, Structural Transformations in the Metal, Energetics Technologies Ltd, Omer, Israel. No date.	Pd-transformations.ppt	P	53
2007	2007 Energetics Technologies Cold Fusion Research and Development. Greenspan and Lesin, June.	ET R&D_June07-Short-Short-Al.ppt	P	52
2007	2007 ET Systems and Results. No date.	System and results-Final.ppt	P	54
2008	Ultrasonically-Excited Electrolysis Experiments at Energetics Technologies	ICCF 14-Paper.pdf	A	5
2008	Ultrasonically-Excited Electrolysis Experiments at Energetics Technologies	ICCF14-Proceedings-Part-A,Energetics, P 106.pdf	A	6
2008	2008 (No Title), All Parts of "Sandwich" Itself… No date.	Sandwich.ppt	P	60
2008	2008 (No Title), Calorimeter Assembly… No date.	Disassembly.ppt	P	55
2008	2008 Energetics Technologies Ltd. Research and Development Activity. September.	Shaul - Introduction.ppt	P	61
2008	2008 Energetics: Data Acquisition System & Data Processing. November	Energetics Data_Acq. System DARPA Nov.08.ppt	P	59
2008	2008 Facilities, Energetics Technologies Ltd. October.	Duncan Visit Oct. 2008-Faciities.ppt	P	57
2008	2008 Measurements Accuracy, Energetics Technologies Ltd. October.	Duncan Visit Oct. 2008-Accuracy.ppt	P	56
2008	2008 Targets Preparation, Energetics Technologies Ltd. October.	Duncan Visit Oct. 2008-targets.ppt	P	58
2008	Electrolytic Closed Cell, Wiring Diagram	Flow cell schemes 2008.doc	W	13
2008	Ultrasonically-Excited Electrolysis Experiments at Energetics Technologies	ET paper ICCF14_V1.doc	W	14
2009	2008 Energetics Technologies Ltd., Overview of Experiment and Results. No date.	ETR&D Aug 2009_EG.ppt	P	62
2009	2009 Energetics Technologies Ltd., Research and Development Activity. June.	ETR&D June 2009s1-Fi.ppt	P	63
2009	2009 Modification of Pd Service – – Some Peculiarities of Pd Behavior during Electrolysis, the Recent Results. No date.	Mark March-09.ppt	P	65
2009	2009 On the Accuracy of Energetics Technologies Excess Heat Determination. Dardik, et al., October	ICCF 15_accuracy 22.09.09 final.ppt	P	64
2009	2009 Thermal Effects in Deuterium Loaded Pd. No date.	Thermal Effects in D2 Loaded Pd Wires - last ver..ppt	P	66
2010	2010 Energetics Technologies Experience in Generating Heat from Palladium-Deuterium Systems. Lesin and El-Boher, September.	MIZU Seminar-September 2010 -V1.ppt	P	68
2010	2010 ET Systems and Results. No date.	System and results Missouri May 2010.ppt	P	70
2010	2010 SKINR: Data Acquisition System & Data	SKINR-	P	69

	Processing. No date.	Data_Acquisition_System_.ppt		
2010	Wires Subjected to SuperWave Modulated Electrical Current. Lesin and El-Boher, September.	A Seminar-September 2010 - MIZU.ppt	P	67
2011	Developing Commercial Energy Sources Based on Deuterium-Palladium Systems (Concept Paper for Early Stage Transformational Project)	Concept paper_Energetics_Revised 8Aug11.pdf	A	7
2011	2011 Energetics Technologies USA. October.	ET_Oct_6,_2011-V1.ppt	P	71
2011	2011 Experiment #1007, 100 Days. No date.	Exprim #1007 for presentation 03-11-2011-short.pptm	P	72
2011	Mastering Energy Generation Using Low-Energy Nuclear Reactions	Mastering Energy Generation Using Low-Energy Nuclear Reactions July 182011.doc	W	15
2012	2012 Anomalous Results in Fleischmann-Pons Type Electrochemical Experiments, (Not SKINR?). Dominguez, et al., August.	ICCF17_FPE presentation final no backups.ppt	P	75
2012	2012 Data Acquisition Systems February 2012.	DATA ACQUISITION SYSTEMS 2012.pptx	P	73
2012	2012 Deuterium (Hydrogen) in Palladium, Structural Transformations in the Middle, Tsirlin, April 2, 2012	SKINR-Apr-22-2012.ppt	P	78
2012	2012 Excess Energy; Experiment #64a. No date.	ICCF11- Selected.pptx	P	74
2012	2012 Open Cell Electrolytic Loading Facilities. No date.	Lab Photos.pptx	P	77
2012	2012 SKINR/ET Systems and Results. No date.	SKINR-ET Exp Results Missouri 2012- Final.pp!	P	79
2012	2012: Analysis of Materials. No date.	lrregularity-Apr-22-2012.pptx	P	76
2013	Progress toward Understanding AHE	Progress Toward Understanding Anomalous Heat-AEB MIT.pdf	A	8
2013	SKINR Pd/SWCNT Gangopadhyay Cathode, November 18-20, 2013	Doc11.docx	W	16
2014	Production of Nanoporous Palladium from a Deuterium Loaded Wire Driven by a Low Energy, Fast Pulser	power modulator pulse system Gahl final_8_10_14_V5.doc	W	17
2015	Effect of Cathode Pre-treatment and Chemical Additives on H/D Absorption into Palladium Via Electrochemical Permeation	Proceedings,BiberianJPjcondensedrICCF 19, 2015.pdf	A	9
2015	Final Report on Calorimetry-Based Excess Heat Trials Using Celani Treated NiCuMn (Constantan) Wires	Final report on calorimetry Final July 23.docx	W	18
2015	Final Report on Calorimetry-Based Excess Heat Trials Using Celani Treated NiCuMn (Constantan) Wires	Final report on Celani Replication July 27-2015.docx	W	19
2015	Search for Low-Energy X-ray and Particle Emissions from an Electro Chemical Cell	Low Energy X rays ICCF19 V2 0_DCP (002).docx	W	20
2015	Search for Low-Energy X-ray and Particle Emissions from an Electro Chemical Cell	Low Energy X rays ICCF19 V2 0_DCP (003).docx	W	21
2016	Final Report on SKINR Replication Experimental Program to Seek Excess Heat Using Ni Powders Mixed with LIAlH4 and Free Li under High Temperature Hydrogen Gas	Final report on SKINR replication experimental program to seek excess heat in Ni+LiAl H4+Li mixture-Poster 1.docx	W	22
2016	Final Report on SKINR Replication Experimental Program to Seek Excess Heat Using Ni Powders Mixed with LIAlH4 and Free Li under High Temperature Hydrogen Gas	Final report on SKINR replication experimental program to seek excess heat in Ni+LiAl H4+Li mixture-	W	23

		Poster 2.docx		
2016	Final Report on SKINR Replication Experimental Program to Seek Excess Heat Using Ni Powders Mixed with LIAlH4 and Free Li under High Temperature Hydrogen Gas	ICCF 20 Arik Paper-Dec. 20,2016.docx	W	26
2016	SKINR HTGL Experimental Procedure Edit As Adapted from the MFMP (Martin Fleischman Memorial Project) Glowstick 5.2 Experiment, v3.1, Last Revised on 06 April 2016	HTGL Procedure v3.1.docx	W	24
2016	SKINR HTGL Summary Report, Last Updated: 27 May 2016	HTGL Summary Report.docx	W	25
2017	G Hubler, 8-14-2017, Comments on the Calibration Run on US4	Report on US4 caibrationGKH - Copy.pdf	A	10
2017	Test Results, US4 and Closed Cell, July 27/2017	Test results July 28 presentation.pdf	A	11
2017	Update Report on US-4 and Closed Cell Calibration	US-4 and Closed Cell Update-August 10, 2017.docx	W	27

5 Annual Reports and Lab Procedures

Annual reports were prepared for SKINR for each year of its existence and submitted to the sponsor, Sidney Kimmel. Rob Duncan developed the first report (2012), and Graham Hubler authored the other five reports (2013-2017)[26]. The enclosures and attachments for the reports are shown below. Copies of the reports are in Appendix E.

Year 1 Annual Report: 2012
Year 2 Annual Report: 2013
- Enclosure 1: SKINR Summary Slides
- Enclosure 2.: ICCF18 Paper
- Enclosure 3: Paper by John Gahl et al.

Year 3 Annual Report: 2014, Part 1
Year 3 Annual Report: 2014, Part 2
Year 4 Annual Report: 2015
- Enclosure 1: Current Science Paper
- Enclosure 2: Current Science Paper
- Enclosure 3: Current Science Paper
- Enclosure 4: Report from Shubhra Gangopadhyay

Year 5 Annual Report: 2016
- Attachment E1: SKINR Facilities
- Attachment E2: Published and Submitted Research Papers
- Attachment E3: Patent Disclosure Form

Year 6 Annual Report: 2017
- Attachment F1: Published and Submitted Research Papers

SKINR and its predecessor organization, Energetics Technologies, also developed lab procedures for their LENR research. The procedures found in the electronic files[27] include the electrolytic cell and other methods of achieving LENR that were used. The lab procedure files are in six categories as shown below. Copies of the procedures are in Appendix F.

[26] "Collection of Sidney Kimmel Institute for Nuclear Renaissance Annual Progress Reports" Memo to Dennis Pease from Tom Grimshaw, December 10, 2018.

[27] "Documents for Experimental Procedures Obtained from Second Visit, September 14, 2018." Memo to Dennis Pease from Tom Grimshaw, October 6, 2018.

1. “General” (in Root Directory)
   - Analysis-review-Feb-2012.docx (File corrupted and cannot be opened)
   - DATA ACQUISITION SYSTEMS 2012.pptx (PowerPoint file)
2. Electrolysis: Closed Cell Assembly
   - Assembly.ppt
   - Catalyst.JPG
   - Cell Description and operation.doc
   - Closed cell brief description.doc
   - Disassembly.ppt
   - Sandwich.ppt
   - Welding&Etching.ppt
3. Electrolysis: Open Cell
   - Appendix
     - Calorimetry X – Appendix 1.xls
     - DAQ1-Appendix2.ini (File could not be opened)
     - Material & Equipment – Appendix 3.xls
   - Equations and Notes .doc
   - Open cell description-procedure-Feb2012
4. Gas Loading
   - GLEM Cell brief description.docx
   - Gas Loading High Temperature Cell for Gas Loading of Powders.docx
5. Glow Discharge
   - Air Cooled Cell Disassembly.docx
   - GD Cell Cleaning.docx
   - GD Running Procedure.docx
   - GDAirCooldedCellAssembly.docx
   - GDHotCellInstallation.docx
   - Photos and calibration example (Folder)
     - Calibration 08
     - Calibration 99
     - DSC4573 to DSCN4594 (22 Images)
6. Ultra Sound Cells
   - 01 Procedure for US lab cells.docx
   - 02 US electrolysis cell running Jan 2011.docx
   - 03 Cavitation Distribution Evaluation.docx

6 Electronic Files

Many electronic files were generated during the life of SKINR and its predecessor, Energetics Technologies. They are stored in various media now in the possession of Dennis Pease[28]. The files are not available to the Project because some of the information falls in the scope of nondisclosure agreements and because it may include confidential SKINR staff information. However, the files have been inventoried and described during several site visits[29,30,31,32]. Photos were taken of the various media, and screenshots of the folders and files were obtained. The files were found to be in the following media:

Medium	Description
1	"Double" hard drive (for automatic backup) in Pease's office ("store" drive)
2	Drives G:, H:, and I: in Pease's office
3	Unconnected hard drive in Pease's office
4	Unconnected hard drive in Pease's office
5	Unconnected hard drive in garage workshop
6	Set of CDs in garage workshop
7	Set of CDs in garage workshop
8	Set of CDs in Pease's office

After the initial inventory (September 15, 2018 memo) was completed, Medium 3 was found to be a CD reader rather than a hard drive, and Medium 5 was actually another photo of the hard drive in Medium 1. Mediums 1, 2, 4, 6, 7, 8 are described below.

Dr. Pease subsequently located three laptop computers containing files that are likely to be relevant to the SLRDP. Three video files have also been added to the Project.

[28] Another hard drive in the possession of Arik El-Boher may become available to the Project in the future.

[29] "Summary of Visit for SKINR Documentation Project, September 14, 2018." Memo to Dennis Pease from Tom Grimshaw, September 15, 2018.

[30] "SKINR Documentation Project: Electronic File Media." Memo to Dennis Pease from Tom Grimshaw, December 17, 2018.

[31] "SKINR Documentation Project: Hard Drives with Electronic Files." Memo to Dennis Pease from Tom Grimshaw, January 14, 2019.

[32] "SKINR Documentation Project: CDs with Electronic Files." Memo to Dennis Pease from Tom Grimshaw, January 30, 2019.

6.1 Medium 1. Primary Hard Drive

Medium 1 is an external storage unit containing two hard drives for automatic backup. It is Dr. Pease's primary location for SKINR electronic files. It is shown in Figure 6-1, and a screenshot showing the highest-level folders is in Figure 6-2. Most of the folders and files of the other Mediums have been copied to Medium 1, which is referenced on Pease's computer as the "store" folder.

Figure 6-1. Medium 1: "Double" Hard Drive (for Automatic Backup) in Pease's Office ("store" Drive)

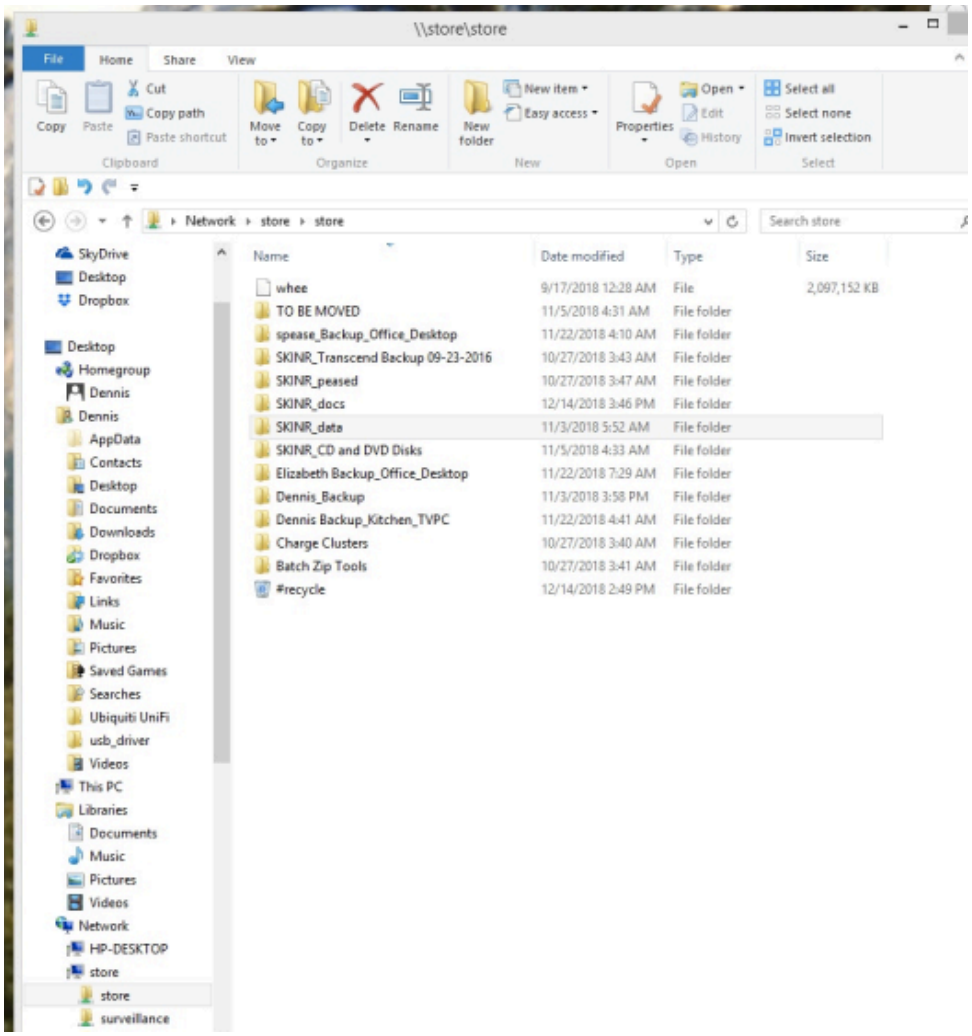

Figure 6-2. Screenshot of Directories in "store" Drive

6.2 Medium 2. Hard Drives G, H, and I

Medium 2 consists of three stand-alone hard drives. They are shown in Figure 6-3. They are referenced on Pease's computer under the "This PC" folder as follows:

easystore (G:)

easy store (H:)

Seagate Backup Plus Drive (I:)

Screenshots of the highest-level folders of Drives G:, H:, and I: are shown in Figures 6-4, 6-5, and 6-6.

Figure 6-3. Medium 2: Drives G:, H:, and I: in Pease's Office

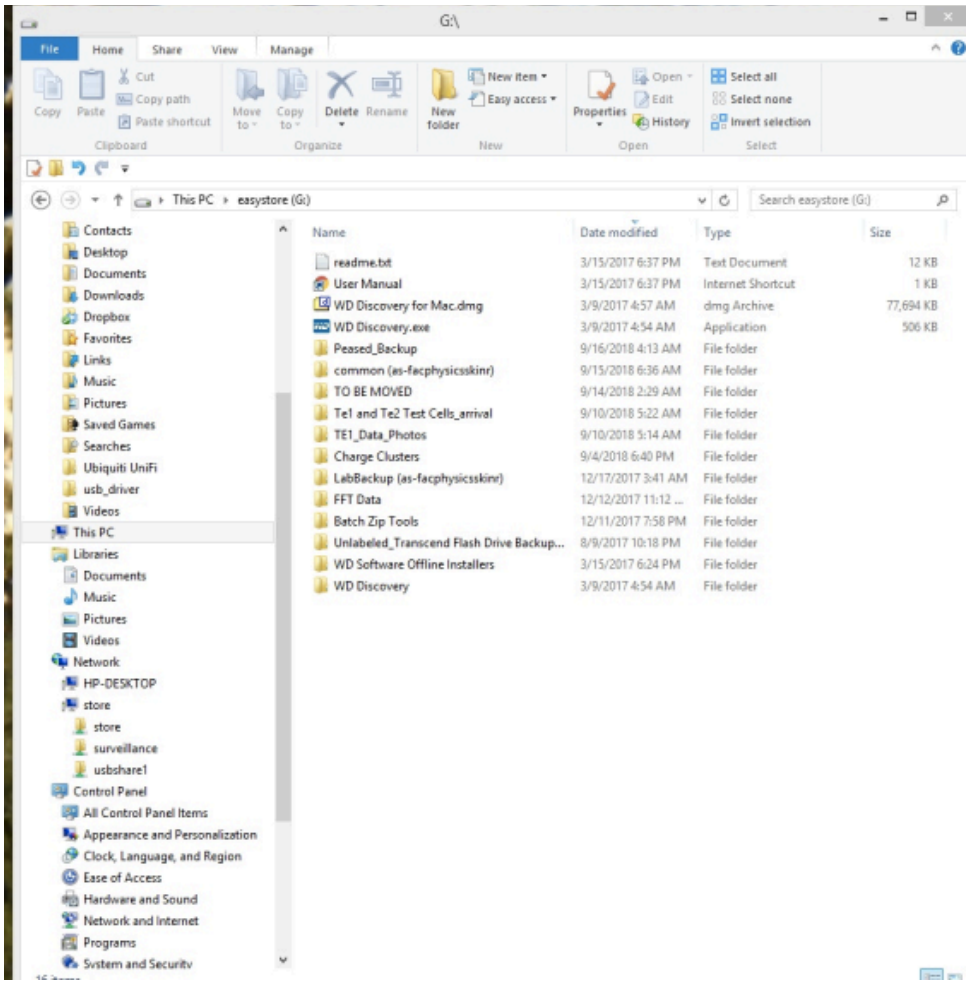

Figure 6-4. Screenshot of Directories in "G" Drive

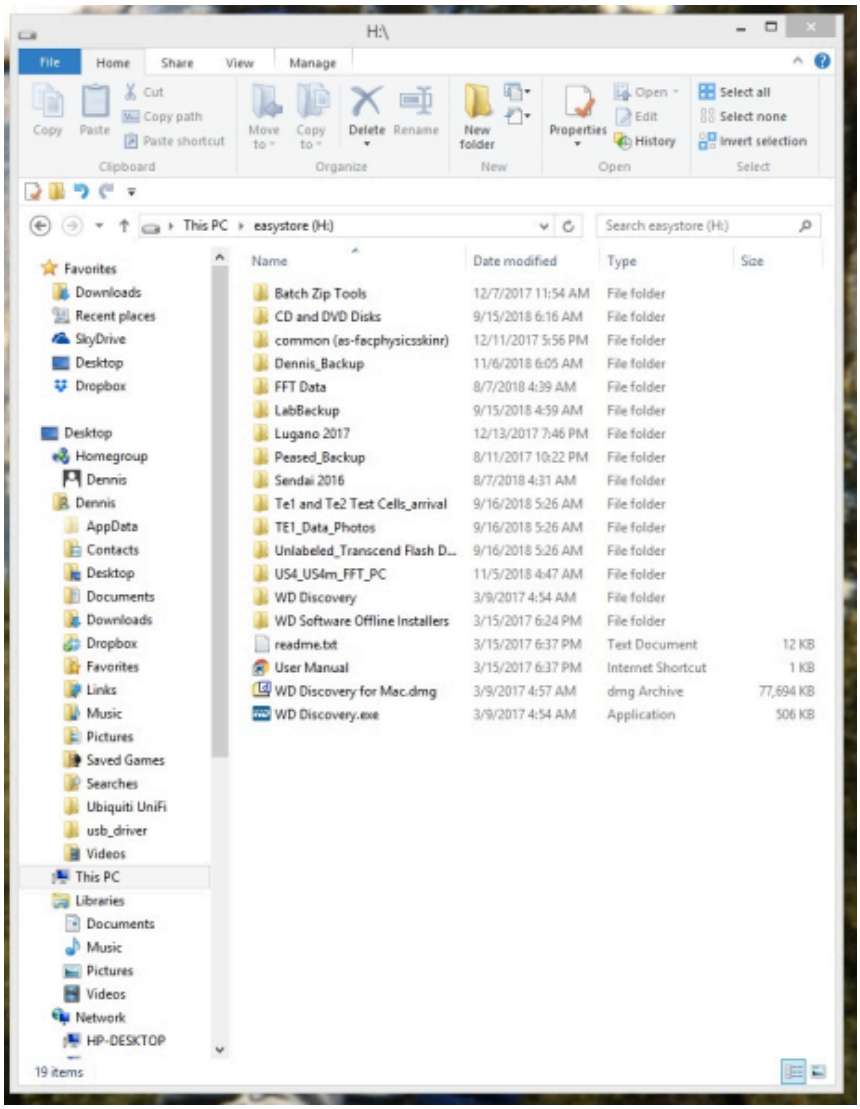

Figure 6-5. Screenshot of Directories in "H" Drive

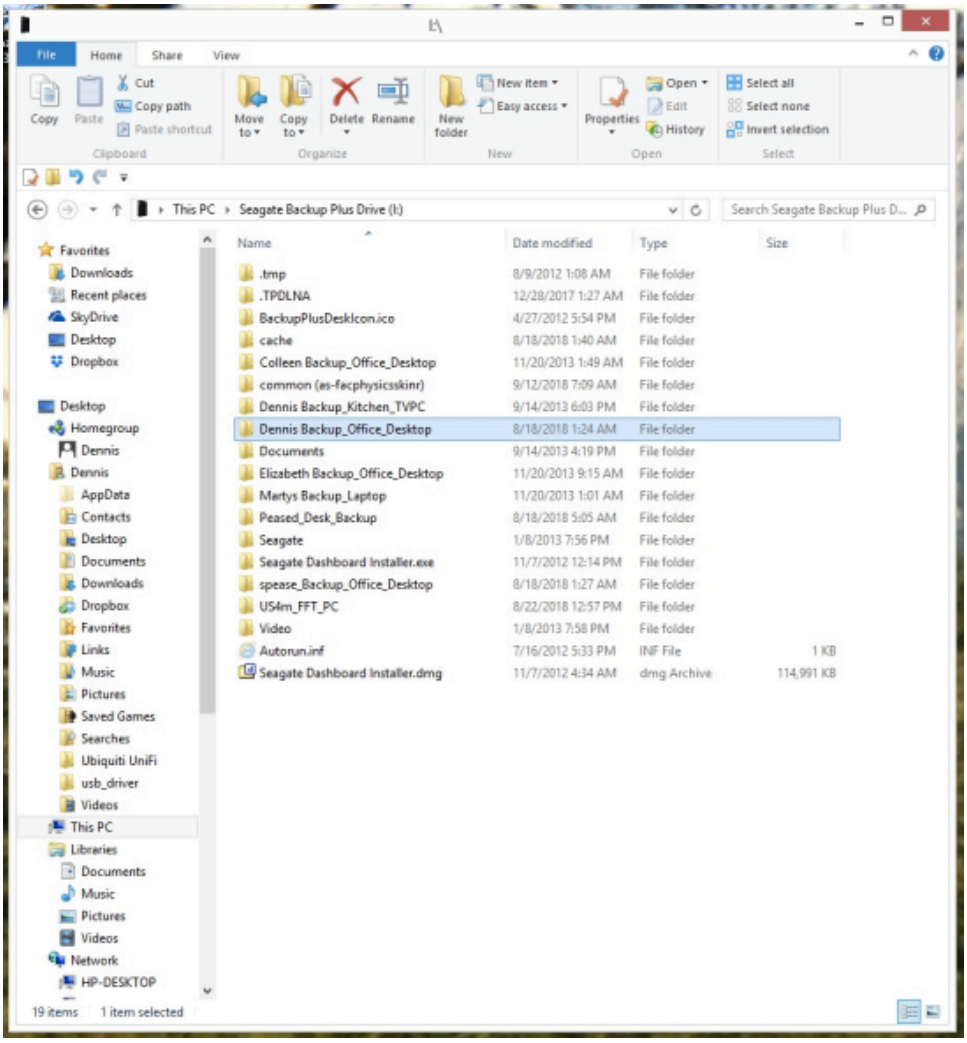

Figure 6-6. Screenshot of Directories in "I" Drive

6.3 Medium 4. Energetics Hard Drive

Medium 4 (Figure 6-7) is an external hard drive that was apparently used for backup of files at Energy Technologies and SKINR. A screenshot of the highest-level directories is shown in Figure 6-8.

Figure 6-7. Medium 4: Unconnected Hard Drive in Pease's office

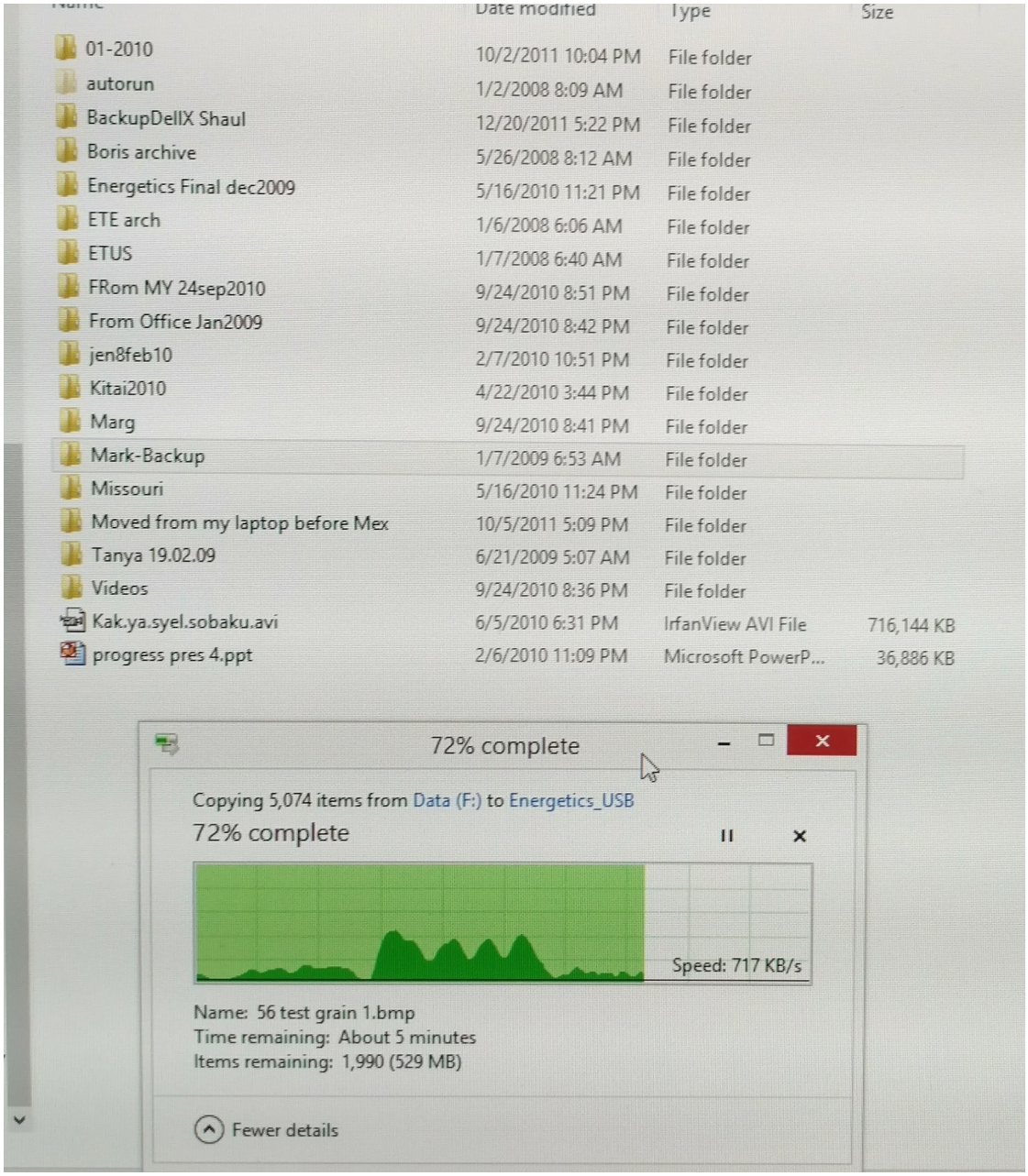

Figure 6-8. Top Level Directories for Medium 4 (Energetics Backup Drive)

6.4 Mediums 6, 7, and 8. CDs with Electronic Files

Many CDs were used for file backup, primarily by Energetics Technologies. They have been identified in three sets based on the type of storage used for the CDs. The directories of folders and files in the CDs have not yet been determined as they have for the hard drives. Medium 6 includes many CDs in a zippered CD holder as shown in Figure 6-9. Most (if not all) of the CDs have a folded sheet of paper with a screenshot of the CD contents.

Medium 7 consists of a plastic CD holder container with two types of CDs (Figure 6-10), one set of about 16 CDs that are in plastic containers and another set of an undetermined number of loose CDs. Eight of the CDs in plastic containers were apparently created in the timeframe June 8 to 28, 2003, which was not long after the start of Energetics Technologies in September, 2002. Medium 8 includes CDs in a cylindrical CD container. It is shown on the left side of Figure 6-11 (the CDs on the right side were moved to Medium 7 after the photo was taken.)

Figure 6-9. Example of Page in Medium 6 CD Holder, Showing Paper with List of CD Contents

Figure 6-10. Medium 7. "Set of CDs in Garage Workshop"
(This Medium now includes CDs that were previously in Medium 8)

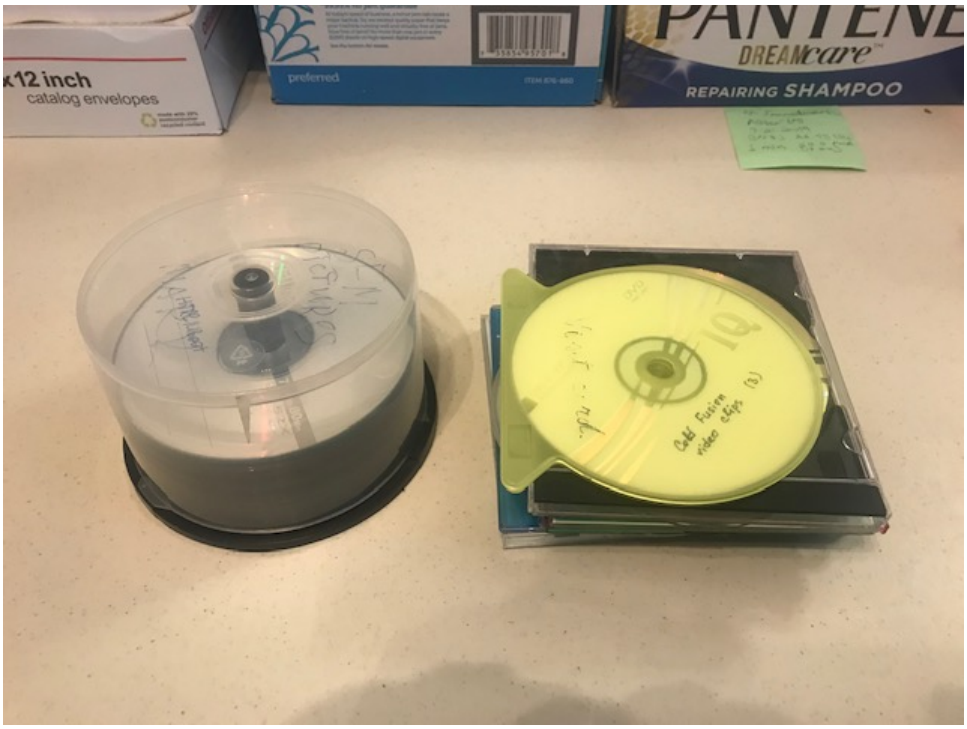

Figure 6-11. Medium 8. "Set of CDs in Pease's Office" (Left Side)
(CDs on right have been transferred to Medium 7)

6.5 Three Laptop Computers

SKINR electronic records are also found on three laptop computers[33]. Figures 6-12 and 6-13 show the Acer computer and a screenshot of its contents. Figures 6-14 and 6-15 similarly show the Asus computer and its contents. The relevant files for the Asus computer are in a folder named "Documents" under OS(C:) → Users → Jinghao. The third computer is a Dell laptop (Figure 6-16). A password for access to this computer could not be located, so it's contents could not be determined.

[33] "Additional Laptops for the SKINR LENR Research Documentation Project" Memo to Dennis Pease from Tom Grimshaw, February 6, 2020.

Figure 6-12. Acer Laptop Computer

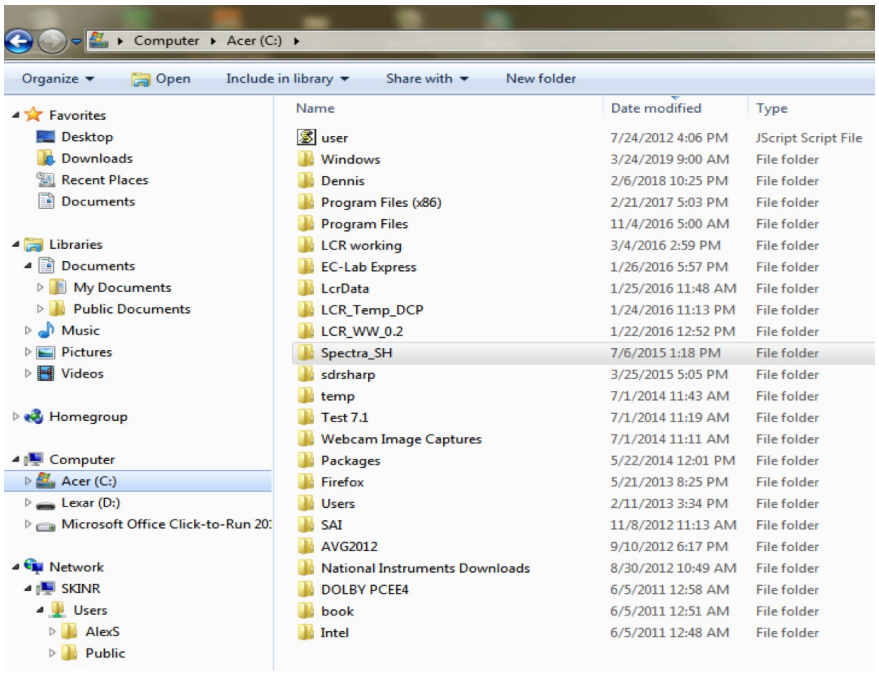

Figure 6-13. Screenshot of Files in Acer Laptop Computer

Figure 6-14. Asus Laptop Computer

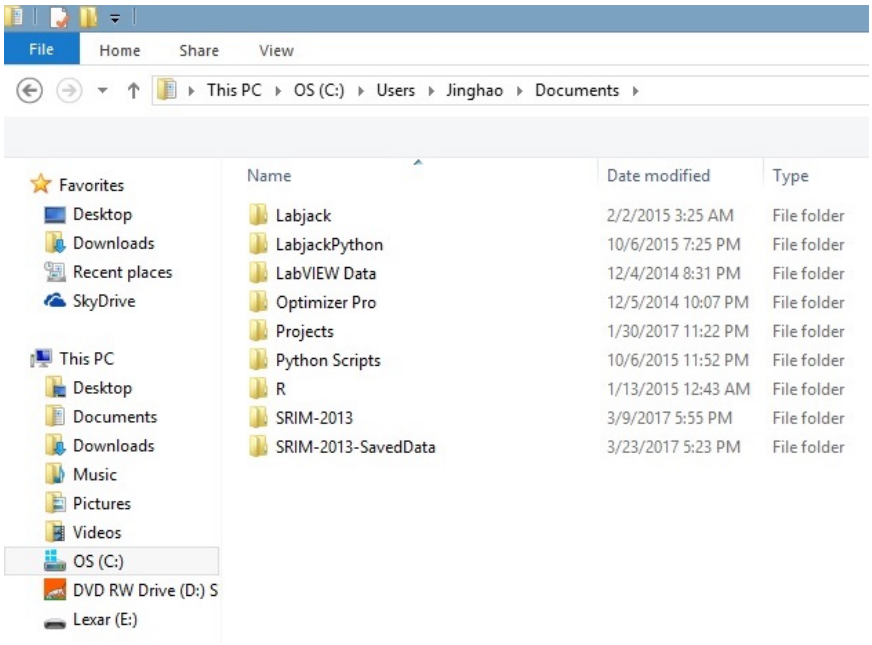

Figure 6-15. Screenshot of Relevant Files in Asus Laptop Computer

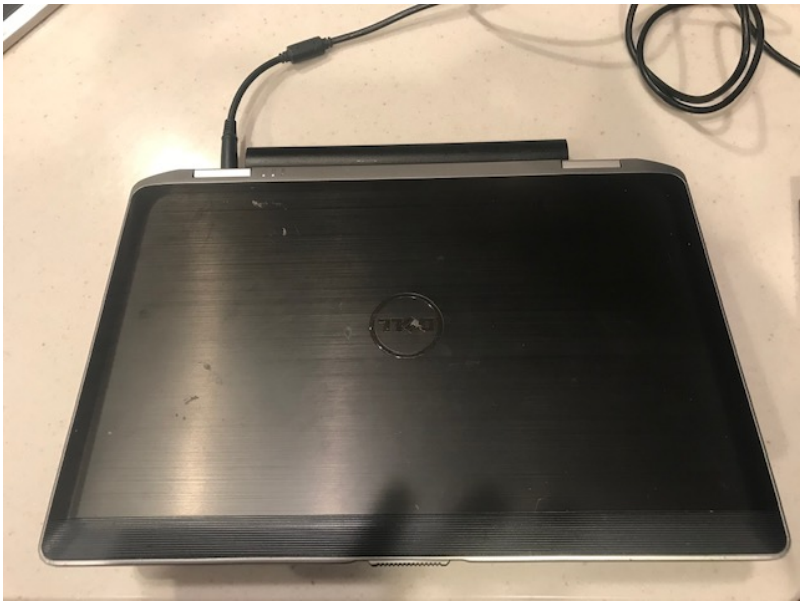

Figure 6-16. Dell Laptop Computer

6.6 Video Files

Among the electronic files of SKINR are three videos, which are listed below[34]:

Superwave Fusion (filename: Energetics ColdFus-- vob)

CBS News "Cold Fusion Is Hot Again" (filename: More Than Junk Science 60 minutes)

Untitled News Program (in Hebrew with English subtitles) (filename: chan fusion english subs)

The CBS News and Untitled News files have been converted from .avi to .mp4 and .mov files so they can be played on a Mac computer. The Superwave Fusion video is an animated description of cold fusion reactions. It is just over 4 minutes long. The CBS News program is well known in the cold fusion. It features Rob Duncan, Michael McKubre, Richard Garwin, and Martin Fleischmann. It is about 12.5 minutes long. The Untitled News Program is from Israel and is in Hebrew with English Subtitles. It features Shaul Lesin and Arik El-Boher, and it includes excerpts from the CBS News program. It is just under 4 minutes in length.

[34] "Three Video Files for the SKINR LENR Research Documentation Project". Memo to Dennis Pease from Tom Grimshaw, February 9, 2020.

7 Hard-Copy Records

When SKINR ceased operations in December 2017, Dr. Pease obtained most of the hardcopy records along with lab equipment as described in Section 1. He obtained additional boxes of the records from the former SKINR location at the University of Missouri in December 2018. The records comprise 11 cardboard boxes (Figure 7-1). A preliminary inventory of the boxes (A to K) took place with Dr. Pease by phone[35]. The overall descriptions of the boxes are shown below.

Box	Description
A	Stack of Brown Envelopes
B	ETE Envelopes. Energetics Technologies: Electrolytic. Graphs, Tables, Envelopes
C	Ten Labeled Containers: ETE, ETG, EL, ETUS, etc. Two Apparently in Hebrew.
D	Nine Labeled Expandable Folders:
E	Envelopes with Experimental Data? ETE-3-60 to ETE-2-63
F	Stacked Envelopes. From ETE-9-525 to ETE-7-169. Similar to Box B.
G	Loose Papers in Manila Folders. Probably from Bill Isaacson's File Drawer
H	Miscellaneous Papers. Source Unknown.
I	Papers from Dennis Pease's Office
J	Manuals
K	Lab Notebooks

Subsequently, the boxes were reviewed individually by Dr. Arik El-Boher, who is very familiar with the records[36]. The resulting recorded descriptions have been transcribed. Table 7-1 shows the boxes with the original descriptions and with the additional detail for each box provided by Dr. El-Boher.

[35] "SKINR Documentation Project: Preliminary Inventory of Storage Boxes" Memo to Dennis Pease from Tom Grimshaw, December 12, 2018.

[36] "SKINR Documentation Project: Detailed Inventory of Hard-Copy Files" Memo to Arik El-Boher from Tom Grimshaw, February 28, 2019.

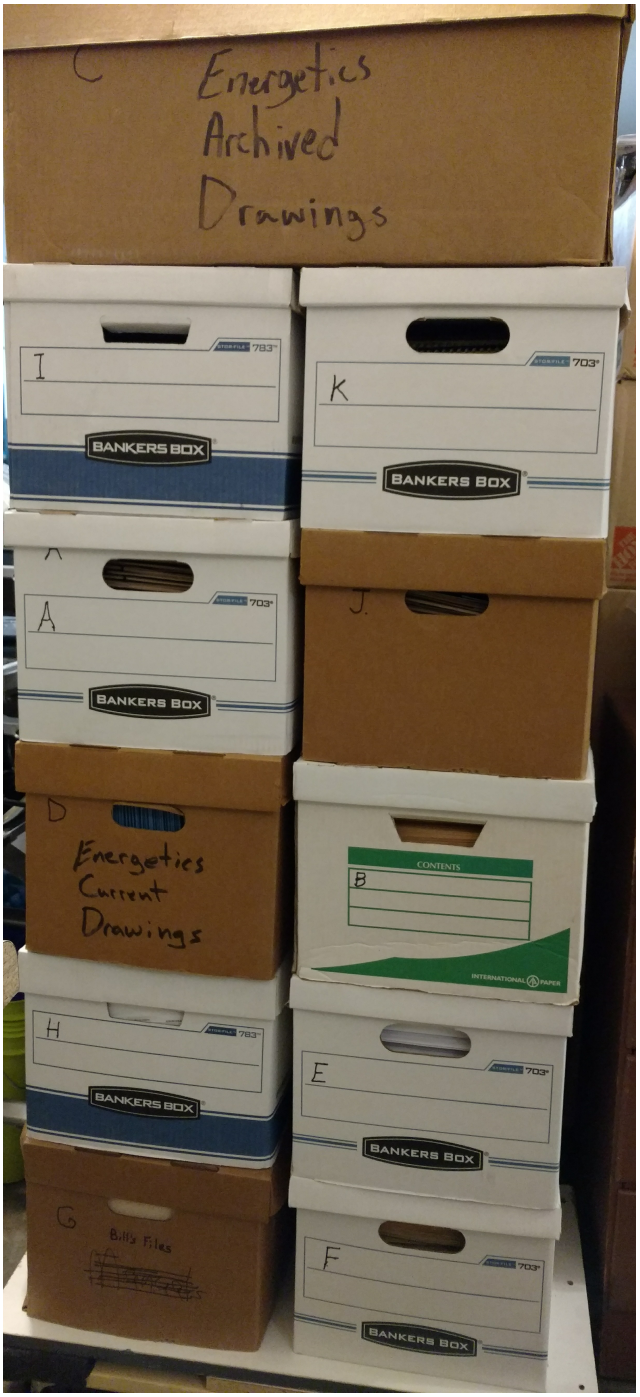

Figure 7-1. Storage Boxes A to K with SKINR Hard-Copy Files.

Table 7-1. Contents of Hardcopy Storage Boxes

Box A. Stack of Brown Envelopes
- Equipment manuals
- Millions of dollars (worth) of equipment
- From Energetics Technologies
- Agilent wave generator
- Examples: digital video camera, pressure controller, conductivity meter, function generator, compressor

Box B. ETE Envelopes. Energetics Technologies: Electrolytic. Graphs, Tables, Envelopes
- Parameter sheets, with data entries
- Dates observed: 2005, 2006, 2007
- Ultrasound experiments
- 1000 electrolytic cell experiments
- 200 with ultrasound
- Also, glow discharge and gas loading
- Reference to "horse" cells
- Certificates for chemical analysis of palladium

Box C. Ten Labeled Containers: ETE, ETG, EL, ETUS, etc. Two Apparently in Hebrew.
- Oversize box with 10 containers
- Cardboard containers with engineering drawings
- Had-made professional drawings by Leonid Mikovski
- Oral Fe scription of the operation of some of the cells by Arik
- Some entries in Russian
- Approximately 270 drawings (9X 30)
- 2002-2003
- Not the entire collection of drawings
- Sell build for (Francesco) Celani
- Later translated into AutoCAD
- Drawings made at Energetics kept technologies:
  Gas Loading Cell. ETGL.1.00.00
  [Energetics Technologies?] (USA). ETE.9. RF Chamber. ETG 4.00.000. ETG 5?.00.000 Chamber. ETE.002
  [Russian]
  [Russian]. ETUS.004. ETUS.02. ETUS.1 Electrolytic Flow Cell. ETUS.7.00.000 Electrolyier. ET.000. EL.001. ET.001. Chamber. ETG 6.00.000 Rev1. ETG 6.00.000 TP
  Electrolyzer Multi Cell. ETE.8.00.00. ETE.05.00.000

Box D. Nine Labeled Expandable Folders:
- "Energetics Current Drawings" on outside of box
- "Manuals" label on outside of box is incorrect
- Blue expandable folders. 11.
- AutoCAD drawings (not manual)
- February 2005. RF Bentley
- RF coatings, plasma coding
- Bill Isaacson AutoCAD
- "Radio Frequency Catalog and Energy Cells"
- "Ultrasound System.2"
- Three packages of unused containers
- Oral description by Arik of the function of the cells and some of the drawings

Box E. Envelopes with Experimental Data? ETE-3-60 to ETE-2-63
- Energetics data sheets for experiments around the time of #64
- Over 100 envelopes?
- Data sheets noted: 32, 33, 37, 38, 39, 42, 46, 53, 54, 56, 57, 60, 61, 62, 67, 68, 69, 87, 92, 94, 95, 103, 106, 121, 133, 151
- Data sheet for #64 apparently not present
- December 2003, January 2004, February 2004

Box F. Stacked Envelopes. From ETE-9-525 to ETE-7-169. Similar to Box B.
- Experimental data sheets
- ETE: Energetics Technologies Electrolytic cell
- 400 sheets
- Approximately 2002 to 2009
- Data sheet noted: 113, 100 652, 169, 524, 525
- ETE-9-525 to ET-9-2169

Box G. Loose Papers in Manila Folders. Probably from Bill Isaacson's File Drawer
- Bill Isaacson files
- Pendaflex hanging file folders
- SKINR files and personal items
- Oral information from Arik about Information about Isaacson's death

Box H. Miscellaneous Papers. Source Unknown.
- Bill Isaacson files
- From position as SKINR administrator
- Receipts from purchases

Box I. Papers from Dennis Pease's Office

- Dennis Pease notes. Yellow tablets
- 2014 noted
- National Instruments cards
- Radiation detector
- Miscellaneous notes

Box J. Manuals

- Packages of manuals
- "Rank four controller"
- Digital caliper
- Millipore water purification system
- Manuals for other equipment: Tektronix, Agilent, data logger, vacuum equipment, Kemper power supply, spot welder
- 50-100 sets of manuals

Box K. Lab Notebooks

- Lab notebooks (approximately 16)
- Superwave example
- Arik oral notations on the contents of some of the notebooks
- Some entries in Russian
- Three green bound notebooks: Energetics Technologies
- One blue bound notebook: Sidney Kimmel Institute for Nuclear Renaissance
- Dark blue and white mottled notebook
- Red and yellow mottled bound notebook
- Yellow pads
- Brown bound notebook

8 Future Opportunities

The SLRDP objectives may be further advanced in several ways. More information may be obtained on the research of ET prior to SKINR and included in the Project. The SKINR and ET publications listed in Section 4 may be reviewed and consolidated to a list of individual entries for each reference. Copies of publicly-available (and within the Project) reports and related documents not yet placed in the Project collection may be obtained. Where possible, the collection of reports may be incorporated in the timeline.

Electronic files, which are not yet included in the Project, may become available. Additional files may become available from the hard drive in Dr. El-Boher's posession or from other hardware still at the University of Missouri. The hardcopy files may be inventoried in more detail and incorporated with other components.

Additional professional resume and interview information for the investigators could be added to the records. The research record and interview transcripts could be analyzed for preparation of a timeline of the experiments and other developments. If a central repository is developed for LENR research records, SKINR would be an excellent candidate for placing and preserving its records in such a location.

SKINR has contributed a great deal to the LENR field. The potential future value of this research record cannot be over estimated.

9 Project Methods

The SLRDP is being performed under the umbrella of the LRDI, which provides an overall procedure[37] as well as flexibility to meet the needs of each researcher and project. As is the case for all LRDI projects, standard project management methods[38] are being used the SLRDP. Six trips have been made on the following dates to collect information[39] and conduct interviews for Stage 1 of the SLRDP:

August 6, 2018
September 14, 2018
December 14-15, 2018
January 11-13, 2019
February 8-10, 2019
December 4, 2019

Memos have been prepared to record progress in information collection and to document the transcriptions[40] (Table 9-1). As noted in Section e, professional biographies have been obtained from Pease and El-Boher to set the context for interviews. The interviews were recorded and transcribed. The transcriptions are in Appendix B. A Dropbox folder has been used to record the information collected, the memos, and the reports. Subfolders are created in the Dropbox folder as progress is made in the SLRDP. They are numbered to maintain the order in which they were created, which may be different from the dates of preparation of the memos. A screenshot of the contents of the folder is shown in Figure 8-1.

[37] Grimshaw, T.W., 2019. Collection, Organization, and Documentation of LENR Research Results: Guideline. January.
[38] Project Management Institute, 2017. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) — Sixth Edition and Agile Practice Guide (ENGLISH). Project Management Institute. Newtown Square, PA.
[39] "Preliminary Assemblage of SKINR Work Products". Memo to Dennis Pease from Tom Grimshaw, September 8, 2018.
[40] "List of Memos Prepared for the SKINR LENR Research Documentation Project". Memo to SKINR Participants from Tom Grimshaw, March 1, 2020.

Table 9-1. List of Memos for the SKINR LENR Research Documentation Project

Date	Subject
9/8/18	Preliminary Assemblage of SKINR Work Products
9/15/18	Summary of Visit for SKINR Documentation Project, September 14, 2018
10/6/18	Documents for Experimental Procedures Obtained from Second Visit, September 14, 2018
12/3/18	Proposed Participation in the SKINR LENR Research Documentation Project (to Arik El-Boher)
12/10/18	Collection of Sidney Kimmel Institute for Nuclear Renaissance (SKINR) Annual Progress Reports
12/12/18	SKINR Documentation Project: Preliminary Inventory of Storage Boxes
12/17/18	SKINR Documentation Project: Electronic File Media
12/18/18	SKINR Documentation Project: Microsoft Word Files from Arik El-Boher
12/20/18	SKINR Documentation Project: PDF Files from Arik El-Boher
1/2/19	SKINR Documentation Project: Presentation Files from Arik El-Boher
1/13/19	Review of SKINR Interviews (to Dennis Pease)
1/13/19	Review of SKINR Interviews (to Arik El-Boher)
1/14/19	SKINR Documentation Project: Hard Drives with Electronic Files
1/22/19	Arik El-Boher SKINR Interviews Reviewed by Arik
1/30/19	SKINR Documentation Project: CDs with Electronic Files
2/28/19	SKINR Documentation Project: Detailed Inventory of Hard-Copy Files
4/10/19	Publicly-Available SKINR Documents on LENR-CANR.org
4/11/19	Publicly-Available SKINR Documents on ResearchGate.net
4/15/19	Reports Noted in SKINR Annual Progress Reports
8/25/19	Transcript of Second Interview (to Graham Hubler)
1/18/20	SKINR WebSITE Files from Graham Hubler
2/6/20	Additional Laptops for the SKINR LENR Research Documentation Project
2/9/20	Three Video Files for the SKINR LENR Research Documentation Project
3/1/20	List of Memos Prepared for the SKINR LENR Research Documentation Project
3/3/20	SKINR Files on Dropbox

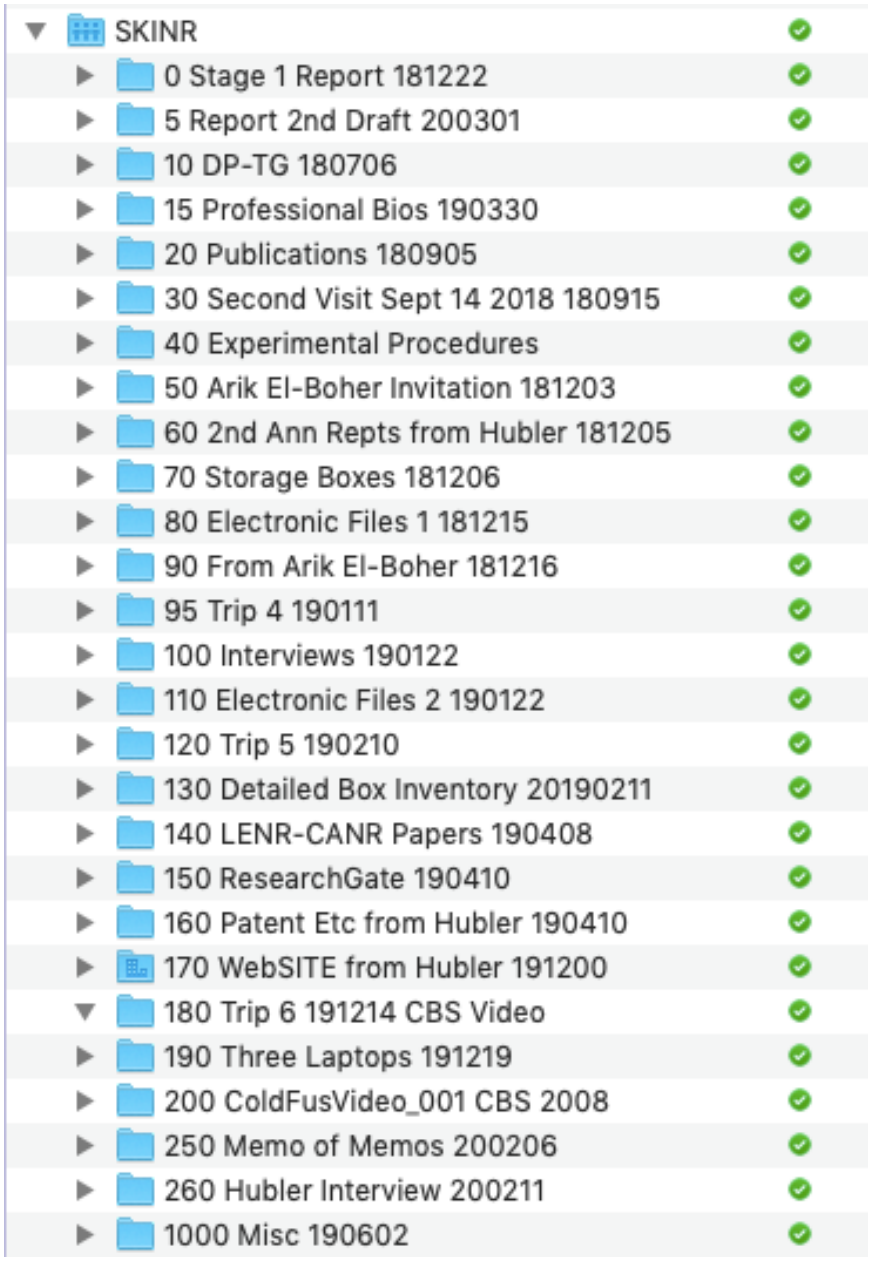

Figure 9-1. Screenshot of "SKINR" Folder on Dropbox

Appendices (Volume 2)

Note: All appendices are in Volume 2 of the Stage 1 report.

Appendix A. SKINR Descriptions

Appendix B. Professional Biographies

Appendix C. Transcripts of Participants' Inteviews

Appendix D. Documents from Arik El-Boher

Appendix E. Annual Reports

Appendix F. Lab Procedures