

NOTICE: This document, apparently written by Holly Adams, ONR IG, contains multiple inaccuracies and misinterpretations. However, references of dates given appear to be accurate and reliable. Document was written between Sept. 1, 2007 and Feb. 28, 2008

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07-010

RECORD OF INVESTIGATION: INQUIRY TRACKING NO. HL#~~06-06~~

**Received:** January 29, 2007

**Complainant:**

Dr. Lefteri Tsoukalas, PhD, former Professor of Nuclear Engineering  
School of Nuclear Engineering at Purdue University

**Subject of complaint:**

Purdue University, Nuclear Physics Department, Research and Integrity Management Officials

**Date of interview with complainant:**

We first contacted Dr. Tsoukalas for a short phone interview on February 13, 2007.

**Allegation:**

The complainant alleged that Purdue University failed "to fulfill its contractual obligations while handling allegations of research misconduct involving one of its ONR-funded projects."<sup>1</sup>

**Witnesses:**

Professor Kenneth S. Suslick, Dept. of Chemistry, University of Illinois at Urbana-Champaign, 600 S. Mathews Ave., Urbana, Illinois 61801, tel: (217) 333-2794, email: [ksuslick@uiuc.edu](mailto:ksuslick@uiuc.edu)

Professor Seth Putterman, Dept of Physics, UCLA, 2-234 Knudsen, Los Angeles, CA 90095, tel: (310) 825-2269, email: [puherman@ritva.physics.ucla.edu](mailto:puherman@ritva.physics.ucla.edu)

Ms Eugenie Samuel Reich, Freelance, Nature, tel: 617-354-0329, email: [eugenie.reich@gmail.com](mailto:eugenie.reich@gmail.com)

Professor Frank Clikeman, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 463-4333, email: [clikeman@ecn.purdue.edu](mailto:clikeman@ecn.purdue.edu)

Professor Lefteri H. Tsoukalas, PhD, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765)-496-9696, email: [tsoukala@purdue.edu](mailto:tsoukala@purdue.edu)

Professor Chan K. Choi, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 494-6789, [choi@ecn.purdue.edu](mailto:choi@ecn.purdue.edu)

Professor Mamoru Ishii, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 494-4587

<sup>1</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

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Professor Tatjana Jevremovic, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 494-4480, email: [tatianaj@ecn.purdue.edu](mailto:tatianaj@ecn.purdue.edu)

Professor Karl O. Ott, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 463-7291

Dr. Anton Bougaev, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, tel: (765) 430-7030, email: [bougaev@ecn.purdue.edu](mailto:bougaev@ecn.purdue.edu)

Mr. Joshua Clinton Walter, Purdue University, 400 Central Drive, West Lafayette, IN 47907-2017, email: [jcwalter@ecn.purdue.edu](mailto:jcwalter@ecn.purdue.edu)

### **Documents:**

- Tab (1) Dr. Tsoukalas' Hotline request for investigation dated January 29, 2007
- Tab (2) ONR Interim Guidance
- Tab (3) DoDI 3210.7
- Tab (4) White House Instruction; Federal Policy on Research Misconduct
- Tab (5) Purdue University Policy C-22
- Tab (6) ONR Email to UCLA
- Tab (7) ONR E-mail/letter to Purdue listing allegations
- Tab (8) Physical Review Letters 96, 034301 of 27 January 2006
- Tab (9) web page information
- Tab (10) Grant information,
- Tab (11) Peccei email
- Tab (12) Email to and from counsel
- Tab (13) Email to Purdue to ask for copies of inquiry
- Tab (14) Email from Purdue denying request
- Tab (15) Official assignment of inquiry to Purdue dtd 29 March 2007
- Tab (16) UCLA ethics regs
- Tab (17) Purdue ext req, ONR answer
- Tab (18) Purdue allegations
- Tab (19) [lanl.2rXiv.org>physics>arXivphysics/0603060](http://lanl.2rXiv.org>physics>arXivphysics/0603060)
- Tab (20) <http://xxx.lanl.gov/abs/physics/0702009>
- Tab (21) Science v311 p 1532 (17th March 2006)
- Tab (22) 13th February 2006 by New York Times
- Tab (23) Taleyarkhan's denial of using ONR funding for his Physical review letters
- Tab (24) Physical Review Letters 96, 034301 (2006)
- Tab (25) Talyarkhan's PRL
- Tab (26) Paoletti email
- Tab (27) Article is "Evidence for Nuclear Emissions During Acoustic Cavitation" (Science Magazine)"
- Tab (28) Coblenz email
- Tab (29) Press release
- Tab (30) "Additional Evidence of Nuclear Emissions During Acoustic Cavitation" (Physical Review E)".

Tab (31) News release Tab (31)  
Tab (32) Confirmatory Experiments for Nuclear Emissions During Acoustic Cavitation  
Tab (33) de Bertodano letter  
Tab (34) (E-Mail From Dr. Tsoukalas to Dr. Choi  
Tab (35) Report From Fact Finding Committee (PDF) Scans of Laboratory's Sign-in Book,  
Jan-June 2004  
Tab (36) Purdue announcement  
Tab (37) Bubble Fusion: Silencing the Hype" (Nature)  
Tab (38) Inquiry Board membership  
Tab (39) Suslick email  
Tab (40) Report  
Tab (41) Rutledge letter  
Tab (42) Rutledge supplement  
Tab (43) Purdue Completes review (article)  
Tab (44) Dr. Tsoukalas email  
Tab (45) Dr. Tsoukalas/Dr. Mason email  
Tab (46) Dr. Jamieson letters  
Tab (47) Dr. Jamieson appt letter (Inquiry Committee)  
Tab (48) Inquiry Board report  
Tab (49) Rutledge letters  
Tab (50) Tsoukalas and Bertodana allegations  
Tab (51) Tsoukalas resignation  
Tab (52) Dunn's letter  
Tab (53) Dunn's letters to Taleyarkhan and Xu  
Tab (54) Taleyarkhan's rebuttal  
Tab (55) Purdue news release  
Tab (56) Provost letter to colleagues  
Tab (57) Reich email to IG  
Tab (58) Purdue email  
Tab (59) Congressional  
Tab (60) Rutledge letter  
Tab (61) NYT Article  
Tab (62) Nature article  
Tab (63) IG tasking  
Tab (64) IG email  
Tab (65) Jischke letter  
Tab (66) Dunn's letters  
Tab (67) Putterman's response  
Tab (68) Rutledge's letter  
Tab (69) Putterman's letter  
Tab (70) Rutledge's response  
Tab (71) Jischke to Miller update  
Tab (72) Putterman email  
Tab (73) Dunn email, IG response

## **References:**

### Governing Directives

- (a) ONR Interim Guidance dated 2003<sup>2</sup>
- (b) DoD 1400<sup>3</sup>
- (c) White House Instruction<sup>4</sup>
- (d) Purdue C-22<sup>5</sup>

## **Allegations and Disposition:**

Dr. Lefteri Tsoukalas made nine allegations. Two allegations were claims of mismanagement for ONR to investigate as required by directive.<sup>6</sup> Seven were allegations of scientific research misconduct and were, therefore, referred to the grantee institution for inquiry and if needed, further investigation.<sup>7</sup> Allegations investigated by ONR IG and their dispositions follow:

1) That in June 2006, pursuant to Dr. Suslick's allegation that Dr. Taleyarkhan committed fraud, Purdue University officials did not conduct an inquiry into those allegations in violation of their own C-22 research and integrity directive and their obligation as a recipient of funding received under ONR grant N00014-05-1-0459.<sup>8</sup> Disposition: **Substantiated.**

2) That Dr. Taleyarkhan's work, during the period of the ONR grant, applies to research described and submitted in his paper to Physical Review Letters 96, 034301 published on 27 January 2006<sup>9</sup> that failed to acknowledge federal funding in violation of ONR's Research Grant Terms and Conditions dated July, 2001. This information is posted on the Office of Naval Research Homepage.<sup>10</sup> Disposition: **Substantiated**

Only the first is substantiated. See page 21.

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<sup>2</sup> Cite: ONR Interim Guidance, Tab (2)

<sup>3</sup> Cite: DoD Instruction, Tab (3)

<sup>4</sup> Cite: Fed Guidance, Tab (4)

<sup>5</sup> Cite: Purdue instruction on Ethics and Integrity, C-22, Tab (5)

<sup>6</sup> Cite: ONR Interim Guidance, Tab (2)

<sup>7</sup> Cite: ONR IG email to Purdue University Officials (Tab 6)

<sup>8</sup> Cite: ONR grant N00014-05-1-0459 was awarded to UCLA with performers located at UCLA, U. of Washington, U. of Illinois, and Purdue University. The single purpose of the first phase of this project, Using Acoustic Cavitation to Produce Thermonuclear Fusion, was to attempt to duplicate the funding of the so-called 'sonofusion' reported several years previous by Dr. Rusi Taleyarkhan and co-workers when he was at Oak Ridge National Laboratory (Tab 10).

<sup>9</sup> Cite: Physical Review Letters 96, 034301 of 27 January 2006, web page information, Tsoukalis complaint, Tabs (8), (9), (1)

<sup>10</sup> Cite: Specifics from website page: [www.onr.navy.mil](http://www.onr.navy.mil), page 6, number 16: (a) Publication of results of the

**Background:**

ONR IG received Dr. Tsoukalas' email hotline complaint on January 29, 2007. Specifically, Dr. Lefteri Tsoukalas alleged that Purdue University failed "to fulfill its contractual obligations while handling allegations of research misconduct on its ONR-funded projects."<sup>11</sup>

According to ONR published guidance, upon receipt of research misconduct allegations, awardee institutions are responsible to conduct an inquiry into the allegations and immediately notify ONR IG, in writing, when an initial inquiry into those allegations results in a determination that an investigation is warranted.<sup>12</sup>

The complainant's evidence indicated that Purdue University had received allegations of scientific research misconduct last summer that were connected with ONR's bubble fusion grant, and that Purdue had conducted a form of an inquiry followed by what appeared to be an investigation, yet failed to notify ONR IG of the matter as required by instruction.<sup>13</sup>

After receiving this information from the complainant, we learned that the awardee institution was, in fact, UCLA vice Purdue, and the funding was from DARPA although the grant was awarded and managed by ONR.<sup>14</sup> In effect, Purdue University was, for all intents and purposes, a sub-awardee of the ONR grant awarded to UCLA. As a result, we pursued the allegations of administrative mishandling with UCLA who asked us, in writing, to work directly with Purdue.<sup>15</sup>

Again, after consulting with our acquisition and legal counsel specialists, ONR IG, with expressed permission of UCLA, asked Purdue officials for their earlier reports of inquiry so that we could determine whether or not they conducted an investigation into the complainant's list of

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research project in appropriate professional journals is encouraged as an important method of recording and reporting scientific information. One copy of each paper planned for publication will be submitted to the Program Officer/Technical Representative in Block 21 of the Award/Modification document simultaneously with its submission for publication. Following publication, copies of published papers shall be submitted to the Program Officer/Technical Representative. (b) The Grantee agrees that when releasing information relating to the Grant, the release shall include a statement to the effect that the project or effort undertaken was or is sponsored by the Department of the Navy, Office of Naval Research. (c) Disclaimer: The Grantee is responsible for assuring that every publication of material (including World Wide Web pages) based on or developed under this award, except scientific articles or papers appearing in scientific, technical or professional journals, contains the following disclaimer: "Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Office of Naval Research." (d) For the purpose of this clause, information includes news releases, articles, manuscripts, brochures, advertisements, still and motion pictures, speeches, trade association proceedings and symposia.

<sup>11</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

<sup>12</sup> Cite: ONR Interim Guidance, Tab (2)

<sup>13</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

<sup>14</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1)) and copy of the grant (contract information) Tab (10)

<sup>15</sup> Cite: Email note from Dr. Peccei, UCLA, Tab (11)

scientific research misconduct allegations and whether or not we should have been notified.<sup>16</sup> Unfortunately, Purdue officials declined our request for copies of the reports. They explained that they had not received official allegations of scientific research misconduct and that the **research (scientific experiments) that were described in the allegations occurred prior to the period of our funding.** They further explained that their earlier inquiry was focused on allegations of academic misconduct vice scientific misconduct, and therefore was not an ONR matter.<sup>17</sup>

In response to their declination, we determined that Purdue University must not have gotten the same allegations of scientific research misconduct that we had gotten, so we accepted the complainant's information as "new and official" allegations of scientific research misconduct and handled them as required by DoD and ONR directives. By directive, upon our receipt of scientific research misconduct allegations, we are to refer them to the appropriate institution for the conduct of an inquiry and, if warranted, follow-on investigation. The institution, in turn, is required to forward inquiry/investigative reports to ONR IG, within 90 days after ONR's notification.<sup>18</sup>

On March 29, 2007, we officially sent allegations of scientific research misconduct to Purdue University officials for handling in accordance with ONR, DoD, Purdue, and UCLA regulations. We withheld the name of the complainant to protect his privacy, but forwarded an extensive list of witnesses with contact information, and **180 pages of documentary evidence,** to help Purdue get the process started.<sup>19</sup> Per instruction, Purdue was given 90 days to conduct their preliminary inquiry. On June 6, 2007, Purdue requested a two-month extension, explaining that they needed extra time to be able to address their growing list of allegations, contact witnesses, and sort through their increasing volume of evidence. We granted the deadline extension to August 27, 2007.<sup>20</sup> We received their preliminary inquiry report, dated August 27, 2007.

As alluded to above, during the course Purdue's preliminary inquiry, the list of allegations grew from seven to 34. **They substantiated approximately twelve allegations of scientific research misconduct and decided to initiate full investigation into those to validate their initial findings.** Their 180-day investigation clock started on September 1, 2007.

#### **Allegations for Purdue to investigate:**<sup>21</sup>

That Dr. Taleyarkhan allegedly conducted scientific research misconduct by fabrication and/or

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<sup>16</sup> Cite: Email to and from Counsel, email to Purdue to ask for copies of inquiry, Tabs (12) and (13)

<sup>17</sup> Cite: Email from Purdue, Tab (14)

<sup>18</sup> Cite: ONR Interim Guidance, Tab (2)

<sup>19</sup> Cite: Official assignment of inquiry to Purdue, UCLA ethics regulations, Tabs (15) and (16)

<sup>20</sup> Cite: Purdue extension request and ONR response, Tab (17)

<sup>21</sup> Cite: Purdue allegations, Tab (18)

falsification of data. Specifically, Dr. Taleyarkhan allegedly showed bubble fusion research data to DARPA in May 2005 (in the paper Multiphase Science and Technology (MST) and slideshow) in one scientific context, and showed identical data to Nuclear Engineering and Design (NED) and Nureth-11 in a different scientific context. Dr. Taleyarkhan was allegedly showing the same results as the outcome of different experiments.<sup>22</sup>

That Dr. Taleyarkhan conducted scientific research misconduct by allegedly, wrongly, and deliberately using Cf-252 in order to duplicate data (approximately six times); data that he published as a fusion signal. In other words, it is alleged that Dr. Taleyarkhan used Cf-252 to fabricate and/or falsify his bubble fusion replication results.<sup>23</sup>

**No hands-on analysis. Only computer simulation of his and Putterman's allegations.**

That in his published response to a forensic analysis by Dr. Brian Naranjo in PRL v97p149404, Dr Taleyarkhan claims to show the same fusion data but, allegedly, actually deleted some of his originally published fusion signal.<sup>24</sup>

That at the bubble fusion demonstration conducted at Purdue on March 1<sup>st</sup>, 2006, Dr. Taleyarkhan allegedly committed acts of scientific research misconduct, witnessed by guest scientists and officials, as described in Science v311 p 1532 (17th March 2006) and cited on the 13th of February 2007 by New York Times.<sup>25</sup>

That Dr. Taleyarkhan used ONR funding for his Physical Review Letters (PRL) paper and has since allegedly claimed he had not.<sup>26</sup>

That Dr. Taleyarkhan reported fabricated and/or falsified information in a 2006 publication. Specifically, it is alleged that Dr. Taleyarkhan made fabricated and/or false claims about his bubble fusion research in a key paper published while receiving funding under ONR grant N00014-05-1-0459, i.e., Physical Review Letters 96, 034301 (2006).<sup>27</sup>

That in January 2006, after spectrum analysis was conducted allegedly proving his use of Cf-252, Dr. Taleyarkhan conducted scientific research misconduct by publishing further fabricated and/or false scientific statements in his PRL: "*Introduction.*—Previously, we have provided evidence [1(a),2–4] for 2.45 MeV neutron emission and tritium production during external neutron-seeded cavitation experiments with chilled deuterated acetone, and these observations have now been independently confirmed [5]"<sup>28</sup>

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<sup>22</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

<sup>23</sup> Cite: Tab (19) [lanl.2rXiv.org>physics>arXivphysics/0603060](http://lanl.2rXiv.org>physics>arXivphysics/0603060)

<sup>24</sup> Cite: Tab (20) <http://xxx.lanl.gov/abs/physics/0702009>

<sup>25</sup> Cite: Tab (21) and Tab (22) Science v311 p 1532 (17th March 2006) and cited in 13th February 2006 by New York Times article

<sup>26</sup> Cite: Taleyarkhan's denial of using ONR funding for his Physical review letters, Tab (23)

<sup>27</sup> Cite: Physical Review Letters 96, 034301 (2006), Tab 24

### For ONR to investigate:

1) That in June 2006, pursuant to Dr. Suslick's allegation that Dr. Taleyarkhan committed fraud, that Purdue University officials did not conduct an inquiry into those allegations in violation of their own C-22 research and integrity directive and their obligation as recipients of the ONR bubble fusion grant.

That Dr. Taleyarkhan's work, during the period of the ONR grant, applies to the research described and submitted in his paper to Physical Review Letters 96, 034301 published on 27 January 2006, that was absent acknowledgement of federal funding in violation of ONR's Research Grant Terms and Conditions dated July, 2001 and posted on the Office of Naval Research Homepage. **ONR not acknowledged because paper not based on ONR grant. See pg. 21**

### Scope of ONR IG investigation into the two allegations:

1) That in June 2006, pursuant to Dr. Suslick's allegation that Dr. Taleyarkhan committed fraud, that Purdue University officials did not conduct an inquiry into those allegations in violation of their own C-22 research and integrity directive and their obligation as a recipient of funding under the ONR grant.<sup>29</sup>

#### Questions:

- Did Purdue receive and know about Dr. Suslick's allegations? If so, when?
- What did Purdue do when they received Dr. Suslick's allegations?
- Did Dr. Suslick's allegations meet the Federal definition of scientific research misconduct?
- What are the rules (Purdue C-22) that regulate allegations of scientific research misconduct?
- Did Purdue University Officials follow the rules?

2) That Dr. Taleyarkhan's work, during the period of the ONR grant, applies to the research described and submitted in his paper to Physical Review Letters 96, 034301 published on 27 January 2006, that was absent acknowledgement of federal funding in violation of ONR's Research Grant Terms and Conditions dated July, 2001 and posted on the Office of Naval Research Homepage.<sup>30</sup>

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<sup>28</sup> Cite: in his PRL: "Introduction.—Previously, we have provided evidence [1(a),2–4] for 2.45 MeV neutron emission and tritium production during external neutron-seeded cavitation experiments with chilled deuterated acetone, and these observations have now been independently confirmed [5]" Tabs (24) and (25).

<sup>29</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

<sup>30</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1)); Paoletti email dated June 26, 2007: "There is a clause in the ONR grant terms and conditions entitled "Publications and Acknowledgment of Sponsorship". The clause requires grantees to include a statement in any information released relating to a grant to the effect that the project or effort undertaken was or is sponsored by ONR. It also requires them to include a disclaimer. To view the entire provision, go to the Acquisition Department section of the ONR homepage and open the Grant Terms and Conditions, clause # 16." Tab (26)



Questions:

- Was Dr. Taleyarkhan's bubble fusion research federally funded between Mar 2005 and Feb 2007?
- Did Dr. Taleyarkhan publish his federally funded bubble fusion findings between March 2005 and February 2006?
- Were Dr. Taleyarkhan's published findings within the scope of his statement of work that was federally funded between March 2005 and February 2006?
- Did Dr. Taleyarkhan's published article mention his federal funding in accordance with ONR grant terms and conditions?
- Did Dr. Taleyarkhan's deliverable satisfy the statement of work that was sponsored by ONR grant?

Findings of Fact:

As early as March 2002, a group of scientists led by Dr. Rusi P. Taleyarkhan, a senior scientist at Oak Ridge National Laboratory, published a paper in the journal, *Science*, about a table-top experiment that created nuclear fusion. The process, called bubble fusion or sonofusion, bombards a solvent with powerful sound waves, causing bubbles to collapse and generate temperatures high enough to fuse together hydrogen.<sup>31</sup>

Per Dr. Coblenz from DARPA, Oak Ridge National Laboratory (ORNL) received funds totaling \$580K for an effort entitled "Controlled, Ultra-High Intensity, Implosion-Based Sonoluminescence", a seedling project that led to the first Sonofusion claim published in *Science*.<sup>32</sup>

After an active recruitment and nearly a year and a half later, on November 7, 2003, Purdue University announced, via news release, the hiring of Dr. Taleyarkhan as a nuclear engineering school professor.<sup>33</sup>

Then on March 24, 2004, an extensive follow-up paper by Dr. Taleyarkhan's sonofusion team appeared in a prestigious journal, *Physical Review E*.<sup>34</sup>

On March 1, 2005, ONR awarded grant N00014-05-1-0459 to UCLA to attempt to duplicate Dr. Taleyarkhan's finding of sonofusion when he was at Oak Ridge National Laboratory. The period of performance under this grant was extended to February 28, 2007.<sup>35</sup>

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<sup>31</sup> Cite: Article is "Evidence for Nuclear Emissions During Acoustic Cavitation" (Science Magazine)", Tab (27)

<sup>32</sup> Cite: Dr. Coblenz email. Tab (28)

<sup>33</sup> Cite: Press release, Tab (29)

<sup>34</sup> Cite: "Additional Evidence of Nuclear Emissions During Acoustic Cavitation" (Physical Review E)". Tab (30)

<sup>35</sup> Cite: Copy of the grant, Tab (10)

In July 23, 2005, Purdue issued a news release claiming independent confirmation of the fusion findings by a second two-member team of Purdue scientists identified as Yiban Xu, a post-doctoral researcher and Adam Butt, a graduate student. Both Xu and Butt were members of Dr. Taleyarkhan's research group.<sup>36</sup>

Later, in October 2005, the same experiment results were presented at a conference in France and appeared in the journal *Nuclear Engineering and Design*. In January 2006 Dr. Taleyarkhan published his statement that his observations were now independently confirmed."<sup>37</sup>

On January 13, 2006, Dr. de Bertodana, Professor at Purdue, wrote Professor Ishli, head of Purdue's School of Nuclear Engineering, about his sonofusion research concerns. Specifically, Dr. de Bertodana stated that he had questions about Dr. Taleyarkhan's bubble fusion experiment and its unusual results. Dr. de Bertodana also expressed his concern that the head of Purdue University's nuclear engineering school, Dr. Tsoukalas, was aware of those questions and neglected to look into the matter.<sup>38</sup>

As result, on February 7, 2006, Dr. Tsoukalas responded to Dr. de Bertodana's questions and concerns raised about Dr. Taleyarkhan's research by forming a fact-finding committee consisting of three Purdue professors; Dr. Chan Choi, Dr. Karl Ott and Dr. Franklyn Clikeman.<sup>39</sup>

The committee completed their inquiry and sent their report, dated February 23, 2006, to Dr. Tsoukalas. The committee concluded that Mr. Butt, the graduate student, did not make any scientific contributions to either paper even though he was identified as a contributor. The committee added their opinion that Mr. Xu answered questions about the paper's authorship "evasively." The committee also noted similarities between the wording in the *Nuclear Engineering and Design* paper and earlier articles by Dr. Taleyarkhan.<sup>40</sup>

On March 7, 2006, Purdue officials announced that they would inquire into Dr. Taleyarkhan's research by convening an Examination Committee (EC) and later release their findings.<sup>41</sup> A day later, on March 8, 2006, the journal *Nature* published a package of news stories questioning

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<sup>36</sup> Cite: News release, Tab (31)

<sup>37</sup> Cite: "Confirmatory Experiments for Nuclear Emissions During Acoustic Cavitation" (*Nuclear Engineering and Design*). Tab (32)

<sup>38</sup> Cite: De Bertodana Letter, Tab (33)

<sup>39</sup> Cite: E-Mail From Dr. Tsoukalas to Dr. Choi, Tab (34)

<sup>40</sup> Cite: Report From Fact Finding Committee (PDF) Scans of Laboratory's Sign-in Book, Jan.-June 2004 (PDF) When questioned about Xu and Butt's independence, Dr. Taleyarkhan maintained that the actual experiments were performed before Dr. Xu and Mr. Butt joined his group. One of the pieces of evidence is the laboratory sign-in book that is required because of the presence of radioactive materials. The sign-in log shows comings and goings of Dr. Xu, but no sign of Mr. Butt. In that same report, the committee cites Mr. Butts' statement that his name was added to the journal article a day before it was submitted. Tab (35)

<sup>41</sup> Cite: Purdue announcement, Tab (36)

bubble fusion and ethical concerns that were circulating throughout the scientific community regarding Dr. Taleyarkhan's fusion research.<sup>42</sup>

The Examination Committee convened on April 16, 2006. Purdue membership included Chairman Dr. R. Byron Pipes, Dr. W. Dale Compton, and Dr. Reifenberger.<sup>43</sup>

Dr. Rutledge, vice president for research, charged the Examination Committee to "(i) discover and examine facts and circumstances surrounding concerns described in recent articles on sonofusion research at Purdue University that have appeared in *Nature* (March 8, 2006) and elsewhere, by reference to published articles, conducting interviews with relevant individuals, and review of materials that may become available; (ii) from your understanding of the facts, to define questions (issues) that must be addressed to resolve these questions (issues); and (iii) to recommend approaches to resolve the questions."

In addition to the charter, Dr. Rutledge further advised that "If, during the course of this initial fact-finding, the Examination Committee receives or recognizes an allegation of potential research misconduct as defined by Purdue University Executive Memorandum C-22, the Examination Committee will describe the allegation and transmit it to the Vice President of Research in the Final report of the Examination Committee. Any such allegations will be addressed using the principles and procedures specified in Executive Memorandum C-22."<sup>44</sup>

On June 1, 2006, Dr. Kenneth S. Suslick, a professor of chemistry at the University of Illinois at Urbana-Champaign and sonofusion team member, sent an e-mail to Dr. Peter E. Dunn, Purdue's associate vice provost for research. In his letter, Dr. Suslick stated that he believed Dr. Taleyarkhan's research might be fraudulent.<sup>45</sup> After meeting several times during the months of April and May, the committee completed its report of findings dated June 5, 2006.<sup>46</sup> When Dr. Suslick wrote his letter, the Examination Committee was finalizing their report.<sup>47</sup>

The Examination Committee considered all issues raised by: a letter written by Professor Martin Lopez de Bertodano to his collaborator, Professor Mamoru Ishii, dated January 13, 2006; the letter written by Professor Ishli to the head of the School of Nuclear Engineering, Professor Lefteri Tsoukalas, dated January 25, 2006; and a February 23, 2006, memorandum from Professors Chan K. Choi, Franklyn M. Clikeman, and Karl Ott to Professor Lefteri Tsoukalas.<sup>48</sup>

The Committee determined that research investigators without an association with Professor

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<sup>42</sup> Cite: "Bubble Fusion: Silencing the Hype" (Nature) Tab (37)

<sup>43</sup> Cite: Inquiry Board membership, Tab (38)

<sup>44</sup> Cite: Rutledge letter, Tab (38)

<sup>45</sup> Cite: Suslick email, Tab (39)

<sup>46</sup> Cite: Report, Tab (40)

<sup>47</sup> Cite: Report, Tab (40)

<sup>48</sup> Cite: Report, Tab (40)

Taleyarkhan appeared to have failed to reproduce the data reported in the original claim for nuclear emissions during acoustic cavitation and explained that there are few, if any, published positive results in this field that were not directly or indirectly influenced by Professor Taleyarkhan.<sup>49</sup>

The Examination Committee further reported that they found the discussions to be complex, convoluted and apparently contradictory so that the determination of probable cause for investigation of academic misconduct by Purdue personnel required more in depth study by consideration of specific questions. Finally, the Examination Committee believed that it was in the interest of the Purdue community to further investigate the details of the disputes and behavior of all those involved and listed their specific concerns.<sup>50</sup>

On June 9, 2006, Dr. Rutledge wrote to Dr. Leah H. Jamieson, Ph.D., Dean, College of Engineering, Purdue University concerning the Examination Committee report. Dr. Rutledge asked Dr. Jamieson to treat the committee's report (and supporting evidence) as an "allegation that research misconduct, as defined by the University's policy on Integrity in Research, Executive Memorandum No. C-22, may have occurred during the conduct of sonofusion research" at Purdue and to appoint a committee to conduct an inquiry into the allegation.<sup>51</sup>

On June 16, Dr. Rutledge wrote a supplement to his earlier letter to Dr. Jamieson. Dr. Rutledge pointed out that the Examination Committee used the wording, "academic misconduct" instead of the words, "research misconduct" and, "based on the input from each of the members of the Examination Committee" Dr. Rutledge concluded that the Examination Committee's use of the term "academic misconduct" was meant to indicate that there may be more than possible "research misconduct" at issue and that the report of the Examination Committee should not be amended to change "academic misconduct" to "research misconduct" or "academic and/or research misconduct".<sup>52</sup>

Just a few weeks later, on June 20, 2006, Purdue announced to the press that their inquiry was completed and, although officials had earlier stated that they would release the inquiry's findings, the university instead decided that the findings would remain confidential, including the existence of any follow-up investigations or disciplinary action.<sup>53</sup>

On July 2, 2006, Dr. Tsoukalas, sent an e-mail to Dr. Sally Mason, Purdue's provost, expressing concern about the inquiry and the unresolved authorship and/or independence issues surrounding

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<sup>49</sup> Cite: Report, Tab (40)

<sup>50</sup> Cite: Report, Tab (40)

<sup>51</sup> Cite: Tab (41)

<sup>52</sup> Cite: Tab (42)

<sup>53</sup> Cite: Purdue Completes Review article, tab (43)

publication of papers involving Dr. Xu and Mr. Butt.<sup>54</sup> On July 9, 2006, Dr. Mason replied to Dr. Tsoukalas. Dr. Mason stated that there was an ongoing investigation and remarked, “we will get to the bottom of what has happened.”<sup>55</sup>

On July 11<sup>th</sup>, Dr. Jamieson wrote a letter to Mr. Adam Butt, Dr. Jay Gore, Dr. Shripad Revankar, Dr. Rusi Taleyarkan, Dr. Yaban Xu, using the term “research misconduct.” Specifically, “...I am informing you of the allegations of possible research misconduct against you...”<sup>56</sup>

Shortly after, on July 31, 2006, Dr. Jamieson appointed an Inquiry Board, “under Purdue University’s Executive Memorandum No. C-22, Policy on Integrity in Research” to “conduct an inquiry into allegations of possible research misconduct under the procedures outlined in C-22.” Using C-22 as its guide, the Board was instructed to conduct an inquiry into allegations of research misconduct identified in the Examination Committee Report and associated materials, to vote to decide if an investigation of one or more research misconduct allegations against any of the named individuals in connection with those matters was warranted, and to prepare a written report of the results of its inquiry with respect to each named individual.<sup>57</sup>

Dr. Jamieson went further to explain that the Examination Committee Report references possible “academic misconduct” and that C-22 does not define or refer to “academic misconduct.” Therefore, because this new Inquiry Board was only chartered under C-22, the Board had neither the responsibility nor the authority to consider whether “academic misconduct” may have taken place, except to the extent that “research misconduct” as defined in C-22 might also be considered to be “academic misconduct.”<sup>58</sup>

On August 30, 2006, the Inquiry Board reported to Dr. Rutledge that it was the opinion of the members of the Inquiry Board that Dr. Rutledge’s letter of June 9 to Dean Jamieson does not, in itself, constitute an explicit allegation of research misconduct as required by C-22. “We believe that, in fairness to all involved, specific instances and events where potential scientific misconduct may have occurred must be identified.” The board also asked Dr. Rutledge to inquire of Professor Tsoukalas and Professor Lopez de Bertodano if either desired to submit more formalized written allegations of research misconduct relating to Dr. Taleyarkhan’s sonofusion work at Purdue.<sup>59</sup>

On September 5, 2006, Dr. Rutledge wrote to Drs. Tsoukalas and de Bertodano, requesting that if they wanted to pursue the matter, they were to prepare any allegations in fully detailed written

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<sup>54</sup> Cite: Dr. Tsoukalas email, Tab (44 )

<sup>55</sup> Cite: E-mail From Dr. Tsou.kalas to Dr. Mason and email From Dr. Mason to Dr. Tsoukalas, tab (45)

<sup>56</sup> Cite: Letters From Dr. Jamieson, Tab (46)

<sup>57</sup> Cite: Dr. Jamieson’s inquiry appointment letter, Tab (47)

<sup>58</sup> Cite: Dr. Jamieson’s appointment letter, tab (47)

<sup>59</sup> Cite: Inquiry Board report to Dr. Rutledge, Tab (48)

statements no later than September 10, 2006.<sup>60</sup>

As result and as directed, on September 5<sup>th</sup>, Dr. Tsoukalas gave Dr. Rutledge a number of research misconduct allegations accompanied by supporting documentation. On September 12<sup>th</sup>, Dr. de Bertodano submitted similar formal supported allegations.<sup>61</sup>

On October 12, 2006, Dr. Tsoukalas resigned as head of the nuclear engineering school.<sup>62</sup>

On December 15, 2006, Dr. Dunn, Purdue Associate Vice Provost for Research, wrote to Dr. Shripad Revankar, Mr. Butt, Dr. Gore, and to Dr. Jamieson on behalf of the Inquiry Board. Dr. Dunn advised them that, by unanimous vote, the Inquiry Board had determined that the conduct of an investigation under Executive Memorandum C-22 was not warranted with respect to their involvement in Dr. Taleyarkhan's research.<sup>63</sup>

Simultaneously, by separate correspondence, Dr. Dunn wrote to Drs. Taleyarkhan and Xu advising them that, according to the report, the Inquiry Board had considered a few allegations set forth in the September 5<sup>th</sup> communications submitted by Dr. Lefteri Tsoukalas and September 12<sup>th</sup> allegations provided by Dr. Martin Lopez de Bertodano.

The specific allegations considered by the Inquiry Board were as follows: That the two publications were "...nothing but a contrived and hurried attempt to stage the appearance of 'independent confirmation' of sonofusion claims; and that Dr. Taleyarkhan participated in the Purdue confirmation(s) reported in the two papers of his sonofusion experiment. The Purdue confirmations are not independent because the tritium measurements were performed with his tritium measuring instrument by a student working for him." By their letter, the Board did not interpret these allegations as allegations of fabrication, falsification, or plagiarism, i.e., scientific research misconduct.<sup>64</sup>

Finally, the Inquiry Board determined that the Bertodano and Tsoukalas allegations "undertake to allege a serious deviation from practices that are commonly accepted within the scientific and academic community for. . . reporting research," within the meaning of the definition of "research misconduct" under Executive Memorandum C-22.<sup>65</sup>

The Inquiry Board also mentioned that Drs. Bertodano and Tsoukalas submitted "no documentary evidence in support of their allegations." According to their report, upon consideration of the evidence that they received from Dr. Taleyarkhan and from the Purdue Information Technology Department, by unanimous vote, the Board concluded that there was

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<sup>60</sup> Cite: Dr. Rutledge letters, Tab (49)

<sup>61</sup> Cite: Tsoukalas and de Bertodana formal allegations, Tab (50)

<sup>62</sup> Cite: Dr. Tsoukalas resignation, Tab (51)

<sup>63</sup> Cite: Dr. Dunn's letter, Tab (52)

<sup>64</sup> Cite: Dr. Dunn's letters to Taleyarkhan and Xu, Tab (53)

<sup>65</sup> Cite: Inquiry Board report to Dr. Rutledge, Tab (48)

insufficient evidence to warrant further pursuit of the Bertodano and Tsoukalas allegations.<sup>66</sup>

Having reached this conclusion, the Inquiry Board nevertheless conveyed to Dr. Taleyarkhan, a number of concerns it had regarding his involvement and conduct in reference to the independent confirmation process. The Board described Taleyarkhan as demonstrating a severe lack of judgment that undermined the claim of independent confirmation. Additionally, Dr. Taleyarkhan had placed junior scientists (postdocs, graduate students) in precarious positions in order to promote his research program.<sup>67</sup>

After reviewing and considering received evidence, the Board concluded that there is insufficient evidence to warrant the formation of an Investigation Committee to further pursue the allegations that had been made by Drs. Bertodano and Tsoukalas with respect to aforementioned publications.<sup>68</sup>

In response to the Board's findings, Dr. Taleyarkhan obtained the services of Attorney, Larry Selander, who wrote a rebuttal to Dr. Dunn on December 20, 2006, claiming that there were, in fact, two sets of scientists/physicists who reported confirmation separately and met all criteria for independence.<sup>69</sup>

Finally, on February 7, 2007, as reported in an article in the Chicago Tribune, Purdue issued a statement that the inquiry into internal allegations of research misconduct had concluded, and the Board determined that the evidence did not support the allegations of research misconduct and that no further investigation of the allegations was warranted.<sup>70</sup>

On February 21, 2007, Provost Sally Mason wrote to her colleagues explaining Purdue University's procedure for reviewing allegations of research misconduct, i.e. Executive Memorandum C-22, and stated that Purdue had followed it carefully concerning allegations against Taleyarkhan in defense of the outcome of their inquiry.<sup>71</sup>

On March 4, 2007, Dr. William Coblenz, DARPA Project Officer, called ONR IG to advise that reporter, Eugenie Reich, had documentary evidence proving that Dr. Taleyarkhan used identical data in more than one published paper, and that Dr. Taleyarkhan claimed that it wasn't the same data. Dr. Coblenz stated that by making a false claim, Dr. Taleyarkhan conducted scientific research misconduct.<sup>72</sup>

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<sup>66</sup> Cite: Inquiry Board report to Dr. Rutledge, Tab (48)

<sup>67</sup> Cite: Inquiry Board report to Dr. Rutledge, Tab (48)

<sup>68</sup> Cite: Inquiry Board report to Dr. Rutledge, Tab (48)

<sup>69</sup> Cite: Dr. Taleyarkhan's rebuttal, Tab (54)

<sup>70</sup> Cite: Purdue News Release, Tab (55) per conversation with Dr. Rutledge and Dr. Mason on May 1, 2007, Purdue denied using the word, exonerated.

<sup>71</sup> Cite: Provost letter to colleagues, Tab (56)

On March 14, 2007, ONR IG addressed these bubble fusion allegations and press release matters with Drs. Rutledge and Dunn by phone to discuss cooperation in resolving Dr. Tsoukalas' allegations of administrative mismanagement. Later on March 14, Ms. Edith Holleman, Counsel for Congressman Miller on the Investigations and Oversight Subcommittee of the House Science and Technology Committee, phoned the ONR IG and expressed an interest regarding the bubble fusion allegations. March 14, 2007, ONR IG got email from reporter, Ms. Eugenie Reich. Her email included at least six questions relevant to bubble fusion allegations.<sup>73</sup> ONR IG referred Ms. Reich to the ONR PAO office without answering her inquiries.

On March 21, 2007, ONR IG noted Purdue's reluctance to provide requested information their two earlier reports of inquiry) via formal letter. In addition, Purdue asked for more specificity, and evidence that any of Dr. Taleyarkhan's alleged acts of scientific research misconduct occurred between the dates March 2005 and February 2007, the ONR grant dates.<sup>74</sup> Immediately, ONR IG filtered through all the available information and answered Purdue's challenge regarding Dr. Taleyarkhan's research and publication between the beginning and ending dates of the ONR grant.

At the same time, prompted by controversial news articles in the scientific sections of prominent newspapers, Congressman Miller wrote to the Purdue President, Dr. Jischke, on March 21, 2007, requesting "copies of any or all reports of inquiry or investigation prepared by any committee or equivalent organization constituted by Purdue University for the purpose of reviewing allegations of misconduct relating to bubble fusion research conducted by Dr. Rusi Taleyarkhan, his laboratory assistants, and Purdue students."<sup>75</sup> Again, Purdue declined to provide earlier inquiries into alleged misconduct, this time to the House Committee.

On March 23, 2007, Dr. Rutledge sent a letter to Dr. Tsoukalas and to Dr. Taleyarkhan that announced the integrity of the evaluation committee(s) and asked both scientists to make themselves available for inspection of his work by their peers.<sup>76</sup>

On the same date, March 23, 2007, the New York Times released Chairman of the House Committee on Science and Technology's Subcommittee on Investigations and Oversight's announcement of Congressman Miller's interest in the bubble fusion controversy. In the article, the Congressman was quoted as saying two important things: 1) "Although Purdue's initial inquiry found there was enough evidence of misconduct to move forward on a full-scale investigation, the university subsequently decided to begin another inquiry which resulted in a finding that the evidence did not support the allegations of research misconduct that that no further investigation of the allegations is warranted; and 2) Under the terms of the Federal Policy

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<sup>72</sup> Cite: Per phonecon dated March 4, 2007, between Dr. Coblentz and ONR IG, Ms. Holly Adams

<sup>73</sup> Cite: Phonecons between IG and Purdue, Ms. Holleman and IG, and Ms. Reich email, Tab (57)

<sup>74</sup> Cite: Purdue email dated March 21, 2007, Tab (58)

<sup>75</sup> Cite: Congressional letter, Tab (59)

<sup>76</sup> Cite: Dr. Rutledge letter, tab (60)



on Research Misconduct, federal agencies rely on universities to conduct fair and full investigations of allegations of misconduct, but we are not sure this happened with the instance at Purdue.” Finally, the article reinforces Chairman Miller’s request for Purdue to supply requested reports to the Committee by deadline of March 30, 2007.

Once the article was released, ONR IG contacted Ms. Edith Holleman, committee counsel, to discuss the House Committee interest and request they refrain from releasing more information to the press in order to salvage what integrity was left in terms of independence concerning the subject of the investigation, Dr. Taleyarkhan.<sup>77</sup>

March 28, 2007, *Nature* article elaborated on the House subcommittee on Investigations and Oversight’s (Congressman Brad Miller, Democrat, North Carolina) interest in bubble fusion controversy and Purdue University’s perceived failure to acknowledge consideration of scientific research misconduct allegations.<sup>78</sup>

On March 29, 2007, ONR IG officially sent allegations of scientific research misconduct to Purdue University officials for handling in accordance with ONR, DoD, Purdue, and UCLA regulations. Purdue officials acknowledged receipt, initiated the inquiry, and started the clock for the 90-day completion deadline.<sup>79</sup>

On April 3, ONR IG advised the complainant, Dr. Tsoukalas, that Purdue had officially acknowledged receipt of scientific research misconduct allegations and had initiated an ONR directed inquiry.<sup>80</sup>

On April 4, 2007, Dr. Jishke, Purdue, wrote back to Congressman Miller’s March 21 letter that he welcomed the opportunity to respond to the request and “wholeheartedly concur with your observation that universities must assure the maintenance of ethical conduct in all research activities carried out by the faculty, students and other researchers under their jurisdiction.” Dr. Jishke explained in his letter that Congressman Miller’s comments concerning the “scope and adequacy of the investigation” by Purdue into “alleged research misconduct” by Dr. Taleyarkhan resulted in findings by two ad hoc committees that “failed to clearly disclose a research misconduct allegation against Dr. Taleyarkhan.”<sup>81</sup>

In the same letter, Dr. Jishke advised Congressman Miller that Dr. Rutledge took the further step of approaching persons who themselves had performed sonofusion research at Purdue and apparently possessed direct knowledge of Dr. Taleyarkhan’s Purdue work, and asked them to submit in writing any research misconduct allegation that they harbored with respect to

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<sup>77</sup> Cite: NYT article on purdue.html, Tab (61), and Phoncon between IG and House

<sup>78</sup> Cite: Nature article, Tab (62)

<sup>79</sup> Cite: IG official tasking, Tab (63)

<sup>80</sup> Cite: IG email, Tab (64)

<sup>81</sup> Cite: Jishke letter, Tab (65)

Dr. Taleyarkhan. In response Purdue received two allegations of research misconduct. Neither concerned falsification, fabrication or plagiarism in Dr. Taleyarkhan's core sonofusion research at Oak Ridge Laboratory. Both allegations were confined to the question whether research reported by Dr. Yiban Xu at Purdue was an independent confirmation of sonofusion.<sup>82</sup>

On April 10, 2007, Dr. Dunn sent letters to a number of potential witnesses and requested their statements and evidence concerning Taleyarkhan's alleged scientific research misconduct.<sup>83</sup>

On April 23, 2007, Dr. Putterman from UCLA, a potential witness, responded to Dr. Dunn's inquiry for information by pointing out that Purdue first mentioned a review of Taleyarkhan's work in March, 2006, and wondered why, a year later, they finally contacted him for a statement.<sup>84</sup> Dr. Dunn immediately replied to Dr. Putterman by repeating his request for evidence.

April 25, 2007, Dr. Rutledge wrote to Deans and Other Chief Academic Officers to ensure the Integrity of Purdue's Research by providing a detailed explanation of C-22.<sup>85</sup>

On April 26, Dr. Putterman advised Dr. Dunn that he did not think the new committee was unbiased.<sup>86</sup>

On April 29, Dr. Rutledge responded to Dr. Putterman. Dr. Rutledge explained that the current inquiry has a larger scope than previous reviews.<sup>87</sup>

In response to a second press release from Congressman Miller, Purdue gave their own press release on or around April 28, 2007. "Purdue has affirmed its strong commitment to do its part to support the integrity of the sonofusion debate, by addressing any alleged breakdown of integrity in sonofusion"

On April 30<sup>th</sup>, "President Jischke gave Congressman Miller an update on Purdue's ongoing leadership initiatives for oversight of research on a laboratory-by-laboratory basis. In addition, earlier this year Purdue commenced a major revision of its policy on research integrity. That revision will incorporate the latest guidelines from the federal Office of Research Integrity and will improve procedures for addressing research misconduct allegations."<sup>88</sup>

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<sup>82</sup> Cite: Jishke letter, Tab (65)

<sup>83</sup> Cite: Dunn's letters, Tab (66)

<sup>84</sup> Cite: Putterman response, Tab (67)

<sup>85</sup> Cite: Rutledge letter, Tab (68)

<sup>86</sup> Cite: Putterman letter, Tab (69)

<sup>87</sup> Cite: Rutledge response to Putterman, Tab (70)

<sup>88</sup> Jischke update to Miller, Tab (71)

On May 1, 2007, Dr. Rutledge and Dr. Mason met with ONR IG. During their visit, Dr. Rutledge provided ONR IG with a complete set of letters and reports that had been previously withheld.

During our meeting with Drs. Rutledge and Mason, ONR IG asked why Dr. Suslick's allegations of last summer were not subjected to an inquiry. Dr. Rutledge replied that he required "written and official" allegations before he could conduct an inquiry and that Dr. Suslick's email did not meet their criteria as an official document. When asked if Dr. Suslick was advised that his email did not meet the criteria, Dr. Rutledge replied that he had not advised Dr. Suslick.<sup>89</sup>

When advised that the C-22 did not describe format for official written allegations, Dr. Rutledge explained that a draft of their revision to directive C-22 includes language that clarifies their criteria.<sup>90</sup>

When asked about the absence of mention of federal funding in the June 6<sup>th</sup> article, Dr. Rutledge explained that the research that was published had been performed at Oakridge Labs; research that was conducted prior to ONR's grant period.

When asked if Dr. Suslick's allegations met the definition of scientific research misconduct, Dr. Rutledge agreed.

ONR IG advised Dr. Rutledge that in Dr. Taleyarkhan's paper in Physical Review E69, 036109 (2004) from Oak Ridge Labs he cites DARPA funds for the detector and electronics, the same detector and electronics used for his January 2006 paper research.<sup>91</sup>

When asked if he was aware that DARPA and Department of Energy (both federal agencies) funded Taleyarkhan's bubble fusion research at Oak Ridge Laboratory, Dr. Rutledge did not reply.<sup>92</sup>

On June 6, 2007, Dr. Dunn asked for an extension to their deadline.<sup>93</sup> The new deadline was set for August 27, 2007. Consequently, we received their preliminary inquiry report, dated August 27, 2007 and learned that Purdue's original list of allegations grew from seven to 34 during the course of their taking witness statements and collecting evidence. According to their preliminary inquiry, Purdue's committee substantiated approximately twelve allegations of scientific research misconduct and decided to initiate full investigation into those twelve to validate their initial

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<sup>89</sup> Per IG conversation with Dr. Rutledge on May 1, 2007. Witnesses: Provost Dr. Sally Mason, Ms. Joan Miller

<sup>90</sup> Per IG conversation with Dr. Rutledge on May 1, 2007. Witnesses: Provost Dr. Sally Mason, Ms. Joan Miller

<sup>91</sup> Putterman email dated March 21, 2007, Tab (72)

<sup>92</sup> Per IG conversation with Dr. Rutledge on May 1, 2007. Witnesses: Provost Dr. Sally Mason, Ms. Joan Miller

<sup>93</sup> Dunn email and IG response, Tab (76)

findings. Purdue's 180-day investigation clock started on September 1, 2007.<sup>94</sup>

## CONCLUSIONS:

Allegation 1: That, in June 2006, pursuant to Dr. Suslick's allegation that Dr. Taleyarkhan committed fraud, Purdue University officials did not conduct an inquiry into those allegations in violation of their own process and their obligations as recipients of the ONR bubble fusion grant.<sup>95</sup>

### Questions:

#### **-Did Purdue receive and know about Dr. Suslick's allegations? If so, when?**

Yes, Purdue official knew about Dr. Suslick's allegations on the date of his email, June 1, 2006.

#### **-What did Purdue do when they received Dr. Suslick's allegations?**

They admitted that they did not respond.

#### **-Did Dr. Suslick's allegations meet the Federal definition of scientific research misconduct?**

Yes

**-What are the rules (Purdue C-22) that regulates allegations of scientific research misconduct?** Purdue was required to conduct a preliminary inquiry into those allegations. If further investigation is needed, they are required to notify the federal funding sponsor, in this case ONR.

#### **-Did Purdue University Officials follow the rules?**

No, they did not follow their rules.

Allegation 2: That Dr. Taleyarkhan's work, during the period of the recent ONR grant was federally funded, specifically as it applies to the research described in appeared in Physical Review Letters 96, 034301 (2006). This paper did not acknowledge federal funding, violation of the Stevens Act (amendment).<sup>96</sup>

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<sup>94</sup> Once their report of investigation (ROI) is received, ONR IG will convene our Science and Technology Inquiry Board (pre-determined membership by instruction) who will review the ROI for adequacy. If found sufficiently thorough, Purdue will be notified and the case into scientific research misconduct will be closed.

<sup>95</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1))

<sup>96</sup> Cite: Dr. Tsoukalas Hotline letter dated January 29, 2007, with enclosures (Tab (1)); Paoletti email dated June 26, 2007: "There is a clause in the ONR grant terms and conditions entitled "Publications and Acknowledgment of Sponsorship". The clause requires grantees to include a statement in any information released relating to a grant to the effect that the project or effort undertaken was or is sponsored by ONR. It also requires them to include a disclaimer. To view the entire provision, go to the Acquisition Department section of the ONR homepage and open the Grant Terms and Conditions, clause # 16." Tab (26)

Questions:

**-Was Dr. Taleyarkhan's bubble fusion research federally funded between March 2005 and February 2007?**

Yes.

Was the alleged SRM funded during this time? No. Xu/Butt, Nuclear Engineering and Design, published on May 3, 2005. The research took place in 2004.

**-Did Dr. Taleyarkhan publish his federally funded bubble fusion findings between March 2005 and February 2006?**

Yes.

Was the alleged SRM published during this time? Yes. Xu/Butt, NED, May 3, 2005. Taleyarkhan et al., Physical Review Letters, Jan. 27, 2006

**-Were Dr. Taleyarkhan's published findings within the scope of his statement of work that was federally funded between March 2005 and 28 February 2007?**

Yes.

Yes, but Physical Review Letters, Jan. 27, 2006 was not funded by DARPA/ONR but by DoE/DHS. It was also a different scope; self-nucleated versus external nucleated

**-Did Dr. Taleyarkhan's published article mention his federal funding in accordance with ONR contractual requirement?**

No.

No, because it wasn't funded by DARPA/ONR. Because it was funded by DoD/DHS, that information was omitted, with agreement, from DoD/DHS.

**DISPOSITION:**

Both allegations are substantiated.

Only the first is substantiated.

**RECOMMENDATIONS:**

Notify UCLA and Purdue of the disposition of the administrative allegations and request they take appropriate corrective action.

We recommend that because the materials we are submitting for review are pre-decisional, they are exempt from disclosure by ONR under exemption (5) of the Freedom of Information Act.

We recommend that if the House Committee requests a copy, we send it fully marked as exempt from their disclosure to the public.

Investigator: \_\_\_\_\_

Holly A. Adams, ONR IG

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**Allegations for Purdue to investigate:**

That Dr. Taleyarkhan allegedly conducted scientific research misconduct by fabrication and/or falsification of data. Specifically, Dr. Taleyarkhan allegedly showed bubble fusion research data to DARPA in May 2005 (in the paper Multiphase Science and Technology (MST) and slideshow) in one scientific context, and showed identical data to Nuclear Engineering and Design (NED) and Nureth-11 in a different scientific context. Dr. Taleyarkhan was allegedly showing the same results as the outcome of different experiments.

That Dr. Taleyarkhan conducted scientific research misconduct by allegedly, wrongly, and deliberately using Cf-252 in order to duplicate data (approximately six times); data that he published as a fusion signal. In other words, it is alleged that Dr. Taleyarkhan used Cf-252 to fabricate and/or falsify his bubble fusion replication results.

That in his published response to a forensic analysis by Dr. Brian Naranjo in PRL v97p149404, Dr Taleyarkhan claims to show the same fusion data but, allegedly, actually deleted some of his originally published fusion signal.

That at the bubble fusion demonstration conducted at Purdue on March 1<sup>st</sup>, 2006, Dr. Taleyarkhan allegedly committed acts of scientific research misconduct, witnessed by guest scientists and officials, as described in Science v311 p 1532 (17th March 2006) and cited on the 13th of February 2007 by New York Times.

That Dr. Taleyarkhan used ONR funding for his Physical Review Letters (PRL) paper and has since allegedly claimed he had not.

That Dr. Taleyarkhan reported fabricated and/or falsified information in a 2006 publication. Specifically, it is alleged that Dr. Taleyarkhan made fabricated and/or false claims about his bubble fusion research in a key paper published while receiving funding under ONR grant N00014-05-1-0459, i.e., Physical Review Letters 96, 034301 (2006).

That in January 2006, after spectrum analysis was conducted allegedly proving his use of Cf-252, Dr. Taleyarkhan conducted scientific research misconduct by publishing further fabricated and/or false scientific statements in his PRL: "*Introduction.*—Previously, we have provided evidence [1(a),2–4] for 2.45 MeV neutron emission and tritium production during external neutron-seeded cavitation experiments with chilled deuterated acetone, and these observations have now been independently confirmed [5]"