

CONFIDENTIAL

STATEMENT BY DR. RUSI P. TALEYARKHAN

I respectfully provide information which I understand is confidential under Purdue University requirements in order to try to be fully responsive to the request from Chairman Brad Miller (“Rep. Miller”) of the U.S. House of Representatives Committee on Science And Technology (“Committee”) to Purdue University’s President, Dr. Martin C. Jischke (“Dr. Jischke”). To provide structure to this response, I have broken down my statement into various categories to address the elements cited in the March 21, 2007 letter from Rep. Miller to President Jischke.

Purdue’s Inquiry Conducted Under the State of Indiana/Purdue University Process

As the February 7, 2007 Press Release from Purdue University affirmed, “Professor Taleyarkhan cooperated fully throughout the inquiry.” I have abided by the expectation of confidentiality required by Purdue’s policy on integrity in research as explained in the State of Indiana/Purdue University Executive Memorandum (EM) C-22 which states:

“The mere suspicion or allegation of wrongdoing, even if totally unjustified, is potentially damaging to a person’s career. Consequently, no information about charges of a lack of integrity in research may be disclosed except to the appropriate university and federal authorities.”

Besides the laws and rules of conduct expected of all citizens, we, as academics, need to abide by loftier ethical standards since we are the ones given the sacred trust to educate young minds, keenly observant of how their Professors “act” and conduct themselves, especially when under duress. This is indeed part of the education experience that these future leaders of America take with them.

As a preliminary matter, it is distressing for me to note the disregard of the EM C-22 rules and policies by my fellow faculty members of Purdue University. Despite direct admonishments from the chief academic officer (the Provost) to specific individuals, this requirement of confidentiality has been blatantly violated, repeatedly. We realize this from statements and articles that have appeared in *Nature* (March 8, 2006). Furthermore, in disregard of EM C-22, supposedly confidential internal documents submitted to support Purdue’s EM C-22 investigations were openly discussed and disseminated to the world via the *New York Times* (and now its web-site). Despite the humiliation and damage to my career and to the technical field of sonofusion, these actions of fellow faculty members have gone on for over a year, with no visible disciplinary action taken so far.

Many people have taken shots at me and my group’s research on sonofusion, but the object of this Committee should not be political or adversarial. I believe that this

Committee should base its findings on the truth, the science, and most importantly, the facts before it. The facts will reveal, as concluded by Purdue University's various internal committees, that there has been no research misconduct on my part, and that I have been an unfortunate victim. I remain committed to cooperating fully to stop this from further continuing to affect my reputation and career and ask for fairness in resolution.

Addressing the Key Allegations

Let me address the key points made in the March 21, 2007 letter from Rep. Miller to Dr. Jischke as I understand them. These allegations are essentially the same as first made in the March 8, 2006 series of *Nature* articles and then repeated in one form or other in the worldwide media. I believe these articles stem from disclosures by Dr. Tsoukalas (ex-Head of School of Nuclear Engineering at Purdue University). These can be outlined as follows:

(1) fraud in terms of using californium (Cf-252), a common laboratory neutron source, to present data of fusion rather than from actual bubble fusion itself. This charge was made not based on actual experiment facts, but rather solely upon computer calculations which are not applicable. The charge has been rebutted in published articles. Furthermore, other independent groups have confirmed bubble fusion.

(2) that the successful replication of sonofusion experiments by Y. Xu et al. as published in *Nuclear Engineering and Design* (2005) were influenced by me and/or my group;

(3) that the willful removal and refusal by me to return experimental research equipment belonging to Dr. Tsoukalas (ex-Head of School of Nuclear Engineering) was meant to prevent him from conducting his research, and,

(4) that the group of researchers at Purdue under Dr. Tsoukalas did not note any positive signs of fusion during their attempts.

1. Fraud Through the Use of Californium

In addition to assisting independent groups to realize bubble fusion for themselves (as noted below), my group provided a scientific rebuttal to the allegations on fraud related to californium (Cf-252). Rather than use the Press to make un-substantiated allegations, we used the time honored scientific route and engaged in dialog and thoughtful response with the journal editors who employed expert referees who could speak their mind under protection of anonymity. It is important to realize that the allegations of fraud were made not based on any hard fact or experimental evidence, but were based on speculations arising on mathematical simulations of an imagined experimental setup. To directly settle matters, we conducted additional experiments, this time actually using the alleged Cf-252 laboratory neutron source and showed directly that, when one uses the actual instrumentation with all built-in complexities of three-dimensional effects and settings of instruments-cum-data acquisition trains that there is no agreement either in terms of

spectrum shape nor in terms of intensity. This is true for the neutron spectrum, but more importantly for the gamma ray emissions where there is an absolute reversal of data (*i.e.*, between the alleged Cf-252 laboratory source and that resulting from bubble fusion as published by our group in 1/06 in the *Phys. Rev. Ltrs.* Journal). After several months of anonymous peer reviews and examinations, we were vindicated. Our successful rebuttal was recommended for publication and published in *Phys. Rev. Ltrs.* Journal (Exhibit 1).

Additional Independent Confirmation of Sonofusion

Three landmark developments occurred in 2007. The hallmark of any major scientific discovery involves independent confirmation by unaffiliated groups of researchers that come to the table without conflicts-of-interest. However, ultimate vindication and vetting of a discovery lies in someone else proclaiming a confirmation of the discovery following the time honored scientific tradition of peer reviews and presentation-cum-publication at international conferences and archival publications. This often takes several years and I by no means have stood in the way of this happening. To the contrary, I have, in fact, helped to facilitate independent confirmation and replication of my discovery as would any devoted scientist.

We learn from history that, for any major discovery, a lag time exists between the first announcement of the discovery and its independent confirmation or replication. For example, in recent memory, Einstein's Nobel Prize winning work related to the *Photoelectric Effect* work of 1905 was at first considered heresy, but eventually confirmed more than a decade later. The rest is history as we know it today in terms of the enormous impact it has in everyday life. In a similar vein, my group announced their discovery in 2002 (first published as a central article coupled with editorial coverage in the March 3, 2002 issue of the prestigious journal *Science*). As noted above, during 2006, following the recent *Nature* attacks, the world has finally experienced two landmark independent confirmation proclamations wherein two papers were presented and published after careful peer reviews in November, 2006 at the *Intl. Meeting of Fusion Energy* and at the mainstay *Intl. Conf. of the American Nuclear Society*, in Albuquerque, New Mexico, USA. This followed other public demonstrations of sonofusion a/k/a bubble fusion to industry, academia and government.

Over several months during 2006, as Purdue conducted its inquiries into research misconduct, Purdue University's sonofusion laboratory and facilities were opened up and made available as a user facility to outside visitors and world-renowned experts to offer real-time demonstrations and independent confirmations of sonofusion. It is commonly accepted practice that individual groups of researchers visit user facilities to conduct their own experiments and obtain their own data, rather than have to reinvent the wheel over several years.

Independent confirmation (May, 2006) by group from LeTourneau University in Texas

An independent self-funded group (comprised of Professor Edward Forringer, and two students from LeTourneau University, Texas) unaffiliated with Taleyarkhan et al. conducted independent experiments during May, 2006 with a grant from the Welch Foundation. Their work included experiments with deuterated liquids and also with control conditions and was accompanied with detailed detector calibrations. This group obtained successful results, confirming the key elements of the discovery with two independent detection systems of their choice — one using a liquid scintillation detector, the other a passive neutron track detector — as published by Taleyarkhan et al. group in their January 2006 *Phys. Review Letters* article. This group's work was documented and submitted for peer review by experts from the American Nuclear Society (ANS). It was accepted for presentation and publication in the November, 2006 conference proceedings of the international conference of the American Nuclear Society (ANS) and also at the November, 2006 Int. Conf. Fusion Energy. Professor Forringer's paper and Abstract are attached along with a Press Release from their University (Exhibits 2, 3 and 4).

Independent confirmation (June, 2006) by Stanford Univ. Prof. W. Bugg

Purdue was also approached by another unaffiliated world renowned expert in nuclear physics who expressed interest in personally observing sonofusion experiments in real-time and obtaining and analyzing his own independent data during the fusion experiments. Exhibit 5 is a report to Purdue University (Taleyarkhan) from Dr. William Bugg, a nuclear scientist with more than 50 years' experience (presently research professor at Stanford University and until recently the Head of the Department of Physics at the University of Tennessee, Knoxville), documenting his successful confirmation of sonofusion and strongly endorsing his support for the effective, unambiguous method employed for a conclusive demonstration of nuclear fusion, which people can physically "see" with their own eyes instead of depending on sophisticated electronics.

Exhibits 2 to 5 constitute evidence for successful independent confirmations during 2006 by totally unaffiliated groups of researchers without conflicts of interest (*i.e.*, Bugg of Stanford University and Forringer from Texas). The works of Forringer and Bugg were funded by their own resources, they used their own chosen and operated detectors, their works have been documented by themselves, peer reviewed, invited for publication and subsequent public announcements / presentations at two major premier international conferences.

Public demonstrations of sonofusion have also occurred

Finally, in addition to the open (now public) reports on confirmation of sonofusion by Forringer et al. and Bugg, the efforts of openness have included demonstrations to visitors from industry, government and academia. Two successful demonstrations on two separate days have been witnessed and acknowledged in writing and signed testimonial documentation has been archived for the record (Exhibit 6).

Therefore, in addition to the earlier published work of Y. Xu (2005), the phenomenon of sonofusion has been replicated and demonstrated by groups other than the original team led by Dr. Taleyarkhan.

The fact that two unaffiliated groups successfully proclaimed to the world and confirmed my group's published results on bubble fusion while taking deliberate pains and actions to confirm and verify the absence of any alleged extraneous fusion source constitutes the proverbial "**smoking gun evidence.**" When coupled with the successful publication of our peer-reviewed rebuttal paper by Taleyarkhan et al. published in Phys.Rev.Ltrs, this should amount to the dismissal of the charges made by detractors as constituting a "red herring" issue.

2. Allegations related to the work of Y. Xu et al.

This topic has been dealt with by Purdue's examination and inquiry committees in depth. A conclusive signed testimonial to the independence aspect is provided as Exhibit 7 (*viz.*, signed letter from Dr. Y. Xu to Purdue University attesting to the fact that he conducted his experiments, obtained his data, conducted his analysis, and made his conclusions all without interference from me). During the time Dr. Xu et al conducted their work, he was supported by and under the direction of Dr. Tsoukalas, the same individual who at the time took credit, but has now reversed himself and has made allegations of misconduct. It was in the July 12, 2005 *Press Release* (<http://www.purdue.edu/UNS/html4ever/2005/050712.Xu.fusion.html>) from Purdue University itself that Dr. Tsoukalas took full credit for having directed and sponsored the successful sonofusion work by Xu et al. That press release was fact-checked and approved by Dr. Tsoukalas.

Much ado is being made of the student Adam Butt's name being together on the Xu et al. NED (2005) manuscript. As explained to Purdue University, Mr. Butt had approached me wishing to perform graduate research in sonofusion. He was first advised to *learn by doing*, and to start to work with Dr. Xu with the goal to understand the science, and review and audit the experimental work of Dr. Xu. By mutual consent Dr. Xu agreed to do this which was also a prudent measure for enabling due-diligence. I did not interfere with this aspect and the extent of reviews and audits conducted by Butt. Butt was invited by Dr. Xu to be co-author and he happily accepted, providing his comments and corrections to the draft prepared by Dr. Xu, posing thereafter for photographs for Purdue's July 12, 2007 *Press Release*, and responding to queries. Mr. Butt played a role in terms of reviewing the actual data analyses and as such it was Dr. Xu's decision to have him as co-author. I had nothing to gain by having a totally unknown student with no credibility in the field as co-author on Dr. Xu's manuscript.

3. Allegations related to stealing experimental equipment

A charge was made in the March 8, 2006 *Nature* article by Tsoukalas alleging that I had taken away Tsoukalas' equipment. This is a particularly damaging charge to my standing in the scientific world, since it attacks my personal character — effectively

alleging that I stole and diverted Tsoukalas' property. This charge has gained particular notoriety since it comes from my own supervisor. In actuality, this is a reversal of fact, as documented and accepted in writing by Tsoukalas in an e-mail dated July 2, 2004 (Exhibit 8). This e-mail exchange documents that the equipment was moved with Tsoukalas' acceptance, direction, gratitude and willingness, and with significant effort on my part. I had offered in writing (see Exhibit 8) to move the equipment back, but the offer was not accepted by Tsoukalas, who instead offered his gratitude for my actions.

4. Allegations that Tsoukalas's group failed to replicate sonofusion results

Before arriving at Purdue from Oak Ridge National Laboratory in Tennessee in September 2003, I already had begun assisting Tsoukalas and others at Purdue to set up a sonofusion experimentation capability. This team, under Tsoukalas' direction, initiated its studies in late 2002. Since then, this group had continual technical guidance and assistance from me. However, in the March 8 *Nature* article, Tsoukalas was quoted as stating that as of 2006 his team had completed several experiments but had not seen any evidence for bubble fusion.

To the contrary, ample evidence exists:

“THE WRITING IS ON THE WALL” –

See photograph image (Exhibit 9).

Tsoukalas not only physically “signed” his name to a wall attesting that bubble fusion (*i.e.*, sonofusion) was indeed successfully achieved, but Tsoukalas conveyed to the press his positive confirmatory attainment. Two such pieces of evidence are presented here:

(1) Exhibit 9 shows a photograph of a statement on the laboratory wall signed by Tsoukalas under the caption “Bubble Fusion was achieved Here.” This is a time-honored tradition in the world of science to commemorate an important development with one's own signature.

(2) Exhibit 10 is an e-mail note, dated January 19, 2005, from Tsoukalas to the producer of the British Broadcasting Corporation (BBC) in which Tsoukalas offers to BBC that his group's confirmatory experiments indeed resulted in statistically significant tritium emissions from experiments with deuterated acetone but not for all of the other control experiments.

Additional evidence pieces have been provided to Purdue University.

IN SUMMARY

To summarize, despite the tireless unwarranted assaults suffered by me, I have abided by the time-honored scientific traditions of methodical conduct and reporting of scientific research. Importantly, the phenomenon of sonofusion has now been replicated and

reported on publicly several times by groups other than mine (which announced the discovery in 2002). These unaffiliated independent groups of researchers conducting their own measurements have replicated my previously published results. Any and all other allegations of research misconduct brought to the attention of Purdue per EM C-22 guidelines have been systematically reviewed by Purdue University using its due process approach. The review results have absolved me of alleged research misconduct as cited in their February 7, 2006 press release. I humbly request that the Committee recognize the facts of this case and help direct the closure of this chapter so that I can get back to putting my life back together.