NATIONAL SECURITY AGENCY
CENTRAL SECURITY SERVICE
FORT GEORGE G. MEADE, MARYLAND 20755-6000

FOIA Case: 85716A
21 November 2016

JOHN GREENEWALD
[redacted]

Dear Mr. Greenewald:

This responds to your Freedom of Information Act (FOIA) request of 16 October 2016 for Intellipedia entries on QUANTUM FIELD THEORY and/or QUANTUM MECHANICS. As stated in our initial response letter, dated 18 October 2016, your request was assigned Case Number 85716. For purposes of this request and based on the information you provided in your letter, you are considered an "all other" requester. As such, you are allowed 2 hours of search and the duplication of 100 pages at no cost. There are no assessable fees for this request. A copy of your request is enclosed. Your request has been processed under the FOIA.

For your information, NSA provides a service of common concern for the Intelligence Community (IC) by serving as the executive agent for Intelink. As such, NSA provides technical services that enable users to access and share information with peers and stakeholders across the IC and DoD. Intellipedia pages are living documents that may be originated by any user organization, and any user organization may contribute to or edit pages after their origination. Intellipedia pages should not be considered the final, coordinated position of the IC on any particular subject. The views and opinions of authors do not necessarily state or reflect those of the U.S. Government.

We conducted a search of all three levels of Intellipedia for the requested topics, and located one document that is responsive to your request. The document is enclosed. Certain information, however, has been deleted from the enclosure.

This Agency is authorized by statute to protect certain information concerning its activities (in this case, internal URLs) as well as the names of its employees. Such information is exempt from disclosure pursuant to the third exemption of the FOIA, which provides for the withholding of information specifically protected from disclosure by statute. The specific statute applicable in this case is Section 6, Public Law 86-36 (50 U.S. Code 3605). We have determined that such information exists in this record, and we have excised it accordingly.

In addition, personal information regarding individuals has been deleted from the enclosures in accordance with 5 U.S.C. 552 (b)(6). This exemption protects from disclosure information that would constitute a clearly unwarranted invasion of

personal privacy. In balancing the public interest for the information you request against the privacy interests involved, we have determined that the privacy interests sufficiently satisfy the requirements for the application of the (b)(6) exemption.

Since these deletions may be construed as a partial denial of your request, you are hereby advised of this Agency's appeal procedures. You may appeal this decision. If you decide to appeal, you should do so in the manner outlined below.

- The appeal must be in writing and addressed to:

  NSA/CSS FOIA/PA Appeal Authority (P132),
  National Security Agency
  9800 Savage Road STE 6932
  Fort George G. Meade, MD 20755-6932

- It must be postmarked no later than 90 calendar days of the date of this letter.
- Please include the case number provided above.
- Please describe with sufficient detail why you believe the denial of requested information was unwarranted.
- NSA will endeavor to respond within 20 working days of receiving your appeal, absent any unusual circumstances.

Sincerely,

Paul K
for

JOHN R. CHAPMAN
Chief, FOIA/PA Office
NSA Initial Denial Authority

Encls:
a/s

(U) Quantum Mechanics

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From Intellipedia

(b)(3)-P.L. 86-36

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(U) Quantum Mechanics is more completely described in Wikipedia and elsewhere [1] . The overview below is intended to provide a basic background, and to allow for organizing of quantum-related topics relevant to the intelligence community.

(U) **Quantum Mechanics** was one of the two foundations of the modern theories of physics as they evolved in the early 20th Century. The first was Einstein's Theory of General relativity, the theory of space and time and the second is Quantum Mechanics, which is essential to understand atomic-scale particles and phenomena. Quantum Mechanics had no single inventor but rather was hinted at by Planck at the end of the 19th century and rapidly developed a couple decades later by Heisenberg, de Broglie, Bohr, Schrödinger, Born, Pauli, Dirac and others.

(U) Quantum Mechanics has a rigorous mathematical set of postulates that describe how to calculate the properties and interactions of atomic and other relevant particles and systems. The result is a state vector that is a wave function that has a probability amplitude related to a measured state of the system. To the surprise of general intuition, this formalism leads to results such as the Uncertainty Principle that imposes unavoidable limits on the accuracy of measurements. Another surprising result is the requirement for non-local interactions that seemingly allow a measurement of part of a system couple by quantum entanglement instantly effect other distance parts of the system. This prediction of non-local interactions and other non-intuitive predictions induced Einstein to conclude that Quantum Mechanics was an incomplete approximate theory, however, all known experimental tests are consistent with the predictions of Quantum Mechanics.

(U) Technically, "quantum mechanics" is the stage of quantum theory that existed from about the 1920s through about the 1940s which focused primariliy on solving problems with a particular set of models developed in the 1930s. As a way of describing the interaction of matter and radiation, it was superceded by the more complete formulation known as "quantum electrodynamics." The current theory for describing the interactions of radiation with matter, which is specially adapted for working on intra-nuclear interactions, is called "quantum chromodynamics," and represents one of the most elegant combinations of almost everything known by modern physics (excluding gravity) into a single consistent theory. But those

distinctions matter primarily to specialists, and the entire field is still often referred to as "quantum mechanics."

See also

- Quantum physics
- Quantum Information
- Quantum Well

References and Sources

Quantum Mechanics

Quantum Computation	Qubit |Quantum Computer | Quantum Computing | Quantum Memory | Quantum Neural Networks
Quantum Cryptography	Quantum Cryptography | Quantum Key
Quantum Effects	Quantum Effects | Quantum Coherence |Quantum Mechanics |Quantum nonlocality |Quantum Optics | Quantum Entanglement | Quantum Teleportation |Quantum Theory
Quantum Information	Quantum algorithms |Quantum information | Quantum Information Science & Technology | Quantum Information Science Panel | Quantum Noise |Shor's algorithm
Quantum materials	Quantum materials | Quantum crystal | Quantum dot | Quantum fluid | Quantum Hall effect | Quantum interference devices |Quantum well | Quantum wire
Quantum sensing	Quantum sensing | Quantum ellipsometry | Quantum holography |Quantum imaging |Quantum metrology | Quantum spectroscopy

Retrieved from [redacted]

Categories: Technology stubs | Quantum | Physics

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