



**Azamat Abdoullaev**  
**Science and Technology in**  
**the 21st Century. Future**  
**Physics & Technology**

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**Аннотация**

Книга о Науке и Технологии 21 века. Какая будет лидирующая наука – Физика X.0 и какая Технология X.0 будущего ждет современное человечество. Ключевые понятия будущего, Первичная Физическая сила, Темная сила и Темная энергия, Теория Всех Вещей и Технологическая сингулярность, связаны одной идейной нитью. Все природные процессы, явления и эффекты объединяются на основе универсального закона обратимости всех природных процессов, а также физической материи, энергии и силовых взаимодействий. Разработана универсальная модель физических сил в рамках новой единой физики, New Physica. Предложена общая концепция будущих прорывных технологий.

# **SCIENCE AND TECHNOLOGY XXI:**

## **Physics X.0 & Technology X.0**

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Annotation

The first book of monographic series of Science & Technology of the 21<sup>st</sup> century is devoted to the Natural Science of Physics and Technology of tomorrow: Physics X.0 and Technology X.0.

New Physics X.0 as the leading natural science naturally unified in terms of convertibility and conservation of all natural forces and reversibility of all physical entities and processes

is promising a dramatic advance in research, knowledge and understanding of the physical world.

All basic assumptions and principles, as symmetry principles and conservation laws, and the latest conceptual developments, as theory of everything or “dark energy” and “dark force”, imply the necessity of Unified Physics X.0 as a replacement of modern fragmentary and overspecialized Physics 2.0.

It is shown that most future technologies and breakthrough innovations will be the engineering products of Natural Science XXI and Physics X.0 coming from the universal reversibility mechanism.

The interconnection of physical phenomena, convertibility of all physical forces, and reversibility of all physical entities and effects, all is enabling to create revolutionary intelligent applications, like as Encyclopedic Knowledge Base in Physical Science for General AI.

## **Preface**

It is the first book of monographic series of Science & Technology of the 21<sup>st</sup> century, devoted to the Natural Science of Physics and Technology of tomorrow. The idea of the Science X.0, Physics X.0, and Technology X.0 is rooted in the terms “Web 2.0” and its indefinite extension, the Web X.0, both superseding the old and static business model of Web 1.0 of Netscape. Initially it was introduced as an “Internet operating system”, “Inventing the Future,” <http://www.oreillynet.com/pub/a/network/2002/04/09/>

future.html; “What Is Web 2.0,” [www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html](http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html).

The Science X.0, Physics X.0, Technology X.0, and Engineering X.0 make the key parts of the World Sustainable Development Roadmap, showing the human civilization development directions, combining scientific achievements, technological breakthroughs and engineering deeds with political, economic, social or organizational innovations.

The Roadmap shows a high way to the New World of Science and Technology, Intelligence and Innovation, Progress and Prosperity:

### **WORLD 1.0 (Industrial World) ::**

**Science 1.0 > Physics 1.0 > Technology 1.0 > Engineering 1.0 > Economy 1.0 > Industry 1.0 > Infrastructure 1.0 > Network 1.0 > Telecom 1.0 > Internet 1.0 > Web 1.0 > Service 1.0 > Medicine 1.0 > Human 1.0 > City 1.0 > Government 1.0 > Nation 1.0 > Society 1.0 > Global Community 1.0 >...Space 1.0**

### **WORLD 2.0 (Post-Industrial Information World) ::**

**Science 2.0 > Physics 2.0 > Technology 2.0 > Engineering 2.0 > Economy 2.0 > Industry 2.0 > Infrastructure 2.0 > Network 2.0 > Telecom 2.0 > Internet 2.0 > Web 2.0 > Service 2.0 > Medicine 2.0 > Human 2.0 > City 2.0 > Government 2.0 > Nation 2.0 > Society 2.0 > Global Community 2.0 >...Space 2.0**

### **WORLD 3.0 (Post-Information Smart World) ::**

**Science 3.0 > Physics 3.0 > Technology 3.0 > Engineering 3.0 > Economy 3.0 > Industry 3.0 > Infrastructure 3.0 > Network 3.0 > Telecom 3.0 > Internet 3.0 > Web 3.0 > Service 3.0 > Medicine 3.0 > Human 3.0 > City 3.0 > Government 3.0 > Nation 3.0 > Society 3.0 > Global Community 3.0 >... Space 3.0 ...> POST-HUMAN SINGULARITY WORLD**

.....  
**WORLD X.0 (Post-Human Singularity World)::**

**Science X.0 > Technology X.0 > Engineering X.0 > Economy X.0 > Industry X.0 > Infrastructure X.0 > Network X.0 > Telecom X.0 > Internet X.0 > Web X.0 > Service X.0 > Medicine X.0 > Human X.0 > > City X.0 > Government X.0 > Nation X.0 > Society X.0 > Global Community 3.0 >...Space X.0**

Science (Mathematics and Physics), Technology, and Engineering are the root causes of historical human development and all the future progress and prosperity of humanity as the socio-technological civilizations.

Science (Mathematics and Physics) is the systematic study of the world, looking for general truths, empirical laws, scientific theories, theoretical systems, and the operations of fundamental laws.

Technology is generally viewed as the systematic study of techniques for changing the world, the human environment, by making and doing things, from simple machines to complex

machinery, as cars or airplanes. It applies science to practice, the theoretical into the practical, associated with scientific products, artefacts, and the useful arts. There are as many technological sciences as scientific disciplines, mathematical, physical, chemical, biological, social, political, ecological, etc.

Engineering is engaged with converting natural resources into machines, machinery, engines, structures, systems, products and processes, applying fundamental scientific principles and technological sciences. Being one of the oldest professions in the world, after physics and mathematics, and producing the Industrial Revolution, it involves such major engineering disciplines, as civil, mechanical, chemical, electrical, as well as geological, nuclear, electronics, communications, instrument, computer, medical, biological, cognitive, social or environmental engineering, with numerous specialties and sub-disciplines.

Common to all diverse fields of science, technology and engineering, they all are grounded on a few fundamental principles of fundamental sciences, mathematics and physics; or, there are no professional technologists and engineers without knowing the fundamental sciences.

Physics X.0 & Technology X.0 & Engineering X.0 aimed to consistently unify a chaotically growing number of new sciences, technical sciences, and new engineering disciplines, focusing on emerging technologies, sophisticated technical innovations and complex cyber-physical ecosystems.

This Big Knowledge Unification covers such complex

intellectual technological and engineering activities, as the Future Internet of Everything, Encyclopedic AI, Intelligent Industry, or Technological Settlements of the Future, Intelligent Nations or Smart Green Cities.

While pursuing the high goal of knowing the unifying principles of nature, the best methods of reversing of natural forces, and optimal converting of natural resources for public utility, *the Physics X.0 is to operate with all the Fundamental Units of Matter, Life, Heredity, Brain and Mind:*

*Forces,*

*Atoms,*

*Energy,*

*Neurons,*

*Genes,*

*Bits,*

*Ideas*

## **PHYSICS X.0: Reversible Universe, Prime Force, and Theory of Everything**

Natural science is about the whole Nature. It studies the entire material universe, its natural causes and phenomena, as the sum total of physical entities and forces, as the infinite system of natural entities, forces, changes and events.

Natural Science XXI makes the New TRIVIUM of major sciences: Physical science, Biological science and Mathematical science.

Physical science is the leading natural science, as doing the systematic study of the inorganic world, being completed with the life science of biology engaged with the systematic study of the organic world.

Its subject is treating of the general properties of matter as a whole, its composition and structure, properties and states, energy and force to formulate the first laws of behavior of the universe and nature, all divided among four interrelated branches: Astronomy, Physics, Chemistry and the Earth science.

The key idea of the physical science and physics itself consists in the insight that **ALL THE FORCES OF NATURE AND FORMS OF MATTER AND ENERGY** are **INTERRELATED** and **INTERCONVERTIBLE**.

Paradoxically, these universal phenomena have never been expressly formulated as the basic principles of nature:

**THE UNIVERSE, NATURE, THE WORLD, or THE COSMOS** is **UNIFIABLE** and **REVERSIBLE**.

**FORCE, MATTER, MOTION, or ENERGY** are neither created, nor destroyed, but **CONSERVED, CONVERTED** and **REVERSED**.

**EVERYTHING REVERSED IN THE WORLD, MATTER INTO ANTIMATTER** and **PROCESS INTO REVERSE PROCESS**.

Technology X.0 is innovated as fostering an intelligently expanding human environment and big quest to explore the depths of an infinitely wonderful physical universe.

It is shown that the most advanced technologies and breakthrough innovations and revolutionary applications are to reversibly convert natural forces, chemical, thermal, electrical, magnetic, electromagnetic, nuclear, gravitational and mechanical, in a closed loop, with zero-waste of matter and energy.

The level of development of future technology and intelligent socio-technological communities is the capacity to control the forces of nature as according the Great Schema of Forces studied by new Physics X.0:

**Prime Force (ToE)::**

**Quantum Gravity Forces (Space Curvature, Standard Model of Cosmology; Electronuclear Force (GUT, Standard Model of Particle Physics)::**

**Strong Interaction (SU (3); Electroweak Interaction (SU(2) x U(1))::**

**Weak Interaction and Electromagnetism U(1em)::**

**Magnetism and Electricity::**

**Non-Fundamental Forces (contact forces, elasticity, viscosity, friction, pressure, etc.)**

Read “SCIENCE AND TECHNOLOGY XXI: Physics X.0 & Technology X.0” to completely change your current conception of PHYSICAL REALITY.

**Physical Science as the Base of Science and Technology**

Physical science is both the key science and the leading natural science, being simple in its principles but universal in the scale

and scope of its application.

Regardless of increasing numbers of experiments and observations, discoveries and divisions, effects and their applications, a small number of universal laws are operating all the acts of the universe, and the same principles regulate all complex processes and all natural forces.

All physical science has three common characteristics while studying the world of changing things, matter in motion, energy in conversion, forces in action, and processes in effects:

1. experimentation and observation and scientific method to study, demonstrate and discover,
2. applying mathematics and strict symbolical formalism to formulate hypotheses, empirical laws, generalizations and their consequences,
3. putting all the phenomena of nature and actions of universe under the fewest number of primary principles and basic laws of nature in the simplest mathematical statements, logical formulations and consistent theories.

All the forces of nature and forms of matter, energy, motion and change are interrelated and interconvertible, so that a network of forces in the n-dimensional space of physical quantities, as space and time, ties the cosmos into a unity, the universe.

These universal properties and fundamental phenomena in need of having been expressly formulated as the basic principles of nature, namely:

I. the UNIVERSE, NATURE, THE WORLD, or THE COSMOS is UNIFIABLE and REVERSIBLE

II. FORCE, MATTER, MOTION, and ENERGY are neither created, nor destroyed, but CONSERVED, CONVERTED and REVERSED

III. EVERYTHING REVERSED IN THE WORLD, MATTER INTO ANTIMATTER and PROCESS INTO REVERSE PROCESS.

If the reversibility properties of nature and the convertibility of energy and unity of the forces of nature had been formulated as a universal principle and basic laws since the very beginning of modern physics, we'd have different physical science, more logical and systematic, predictive and productive, more esthetic and attractive, smarter or more intelligent and machine-wise.

Physical science is the base of modern technology, innovation and applications, which laws and principles are at the core of most engineering sciences and future technologies, see Supplement1.

So to create future Technology X.0, we need new physics, Physics X.0.

### **The State of Affairs of Physical Science**

Physical science is traditionally defined as the natural science doing the systematic study of the inorganic world, as being completed with the life science of biology doing the systematic study of the organic world.

Its subject is treating of the general properties of matter as

a whole, its composition and structure, properties and states, energy and force-relations to formulate the first laws of behavior of the universe and nature basing on natural ontology and mathematics, as divided among four interrelated branches:

**Astronomy**

**Physics**

**Chemistry**

**the Earth science**

**Astronomy**

Astronomy, including astrophysics and cosmology, studies the entire universe beyond the Earth, including the universe's structure and evolution, its cosmic objects (as stars, galaxies, planets, moons, asteroids, comets and nebulae) and their physical processes (as supernovae explosions, gamma ray bursts, and cosmic microwave background radiation, etc.), and how the Earth relates to interactions with the solar system.

**Chemistry**

Chemistry treats of the structure, composition and properties of substances and all possible changes, transformations or reactions they undergo, being about the properties and reactions of molecules. It is about the interactions of substances through chemical reactions to form different substances, including analytical chemistry, inorganic chemistry, organic chemistry, biochemistry, polymer chemistry, physical chemistry, and industrial chemistry.

**The Earth science**

Earth science is dealing with planet Earth, how the natural environment (ecosphere of geosphere and biosphere or Earth ecosystem) works and evolves, including the study of the atmosphere, hydrosphere, lithosphere, and biosphere, involving atmospheric science and environmental science, geology and geography, geoinformatics, glaciology, oceanography and soil science.

### **Physics**

The core of physical science, physics, deals with the structure of the matter and the interactions of the fundamental constituents of the universe, including all the hypothetical constructs like as “dark energy”, “dark matter”, or “dark force”. It is the science that treats of matter and energy, forces and interactions and their regularities and laws governing the reciprocal interplay while being tested and proved by analysis and observation, control and measurement.

### **Mathematics**

Mathematics, as the key tool of natural science, is emerging as the abstract science of structure, order and relationship. As applied mathematics, mathematical physics has to generate a complete and consistent representation of nature as the system of natural entities, forces and changes, the total sum of material existences and forces in the universe, all in terms of mathematical systems of definitions and axioms, rules, as the function rule, principles, as duality, and theorems, deduced laws.

### **Natural Ontology**

Natural ontology is the study of the universe as such, the basic features of all the universe, as the nature of force, matter and energy, space and time, natural entities and cause-effect relationships. As an example, mathematical and theoretical physics is to combine physics, mathematics and theoretical ontology of nature. Or, the unity of the all forces of nature is an ontological axiom.

Therefore, despite seeming differences, all the physical sciences are interrelated by the basic principles underlying all natural processes, phenomena and interactions, provided by the principal natural science of physics.

### Modern Physics: Its Key Subjects and Principles

“Physics has evolved and continues to evolve without any single strategy”, while its ultimate goal to find a unified set of principles and laws governing force and energy, matter and change, at micro-, meso– and macro-world (*Physical Sciences, the New Encyclopedia Britannica, 25, Knowledge in Depth, Chicago-Toronto, Encyclopedia Britannica, Inc., 1994* ).

Generally, the key achievements in physical science lie in the serendipitous and intuitive and ingenious discovering of empirical physical laws and effects, subatomic entities, symmetry principles, conservation laws, or unified force fields (*See Supplement 1. All Nobel Prizes in Physics. Available: [https://www.nobelprize.org/nobel\\_prizes/physics/laureates/](https://www.nobelprize.org/nobel_prizes/physics/laureates/)*).

Modern physics was founded as an empirical synthesis of separate sciences: mechanics, optics, acoustics, electricity,

magnetism, heat and studies of matter and its properties.

Meantime, the whole idea of physics consisted in the intuitive understanding that different forces of nature and forms of energy are INTERRELATED and INTERCONVERTIBLE, but **these universal phenomena have never been expressly formulated as the basic laws of nature**. The Faraday's intuitive belief in the unity of the forces of nature, or that all the forces of nature are but manifestations of a single universal force and must be convertible one into another made possible the classical electromagnetic field theory, the foundation of modern physics.

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