Programs and Projects within the TETRAD Institute

A Brief Overview

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Programs and Projects

TETRAD Institute is focused upon basic and fundamental research and also direct applications of the results from such research. There are two (2) Centers, seven(7) ongoing long-term Programs and within these are nine (9) Projects which are permanent, ongoing and mutually supportive.

RTD (Reflexive Topological Dynamics) – fundamental theoretical physics. The RTD theoretical work is focused upon the emergence of dimensional including extensional and temporal order and structure from a matrix of apparent randomness that implicitly contains topological information potential and provides a foundation for the evolution of elementary physical and cosmological phenomena and complex systems including atomic, molecular and biological form and organization.

Main Projects:
TERANOD (controlled compact fusion power generation)
CYGNUS (low-energy non-ballistic particle transformation)

(principal websites: PRIMUS Center: www.primus.tdyn.org, www.tdyn.org/martindudziak)

TBD (Topological Biomolecular Dynamics) – Extension and expansion of the RTD theoretical model within the domain of biological form and organization, focusing upon macromolecular evolution and development and biological communications and cybernetics that involve topological structure and order, and synergistic (whole-to-component) influence and control. A principal area of investigation is in the non-Turing quantum computational mechanisms, involve CQER (coherent quantum entanglement resonance), involved in viral and cellular processes and the immune/autoimmune response and its ability to both respond and to dysfunction.

Main Project:
ICMC (Immuno Cyto Molecular Computation/Communication)

(principal websites: PRIMUS Center: www.primus.tdyn.org, www.tbd.tdyn.org, www.tdyn.org/martindudziak)

NeoPlexus – development of a Generalized Heterogeneous Computing Machine architecture and implementation. This involves direct application of RTD theory and other research including in neurobiology to computer science and engineering. This work is focused upon the design and experimentation of a topological information resonance architecture that implements a non-Turing-machine form of quantum computing. The GHCM combines conventional bit/byte Turing computing and qubit-based quantum computing with a molecular-based non-Turing computer, employing quantum-theoretic operational principles, capable of learning, recognizing and inventing complex patterns of information through a neurobiologically-based (connectome-model) architecture.

Main Project:
GHCM (Generalized Heterogeneous Computing Machine).

(principal websites: PRIMUS Center: www.primus.tdyn.org, www.neoplexus.tdyn.org, www.tdyn.org/martindudziak; IRI: www.intelrenaissance.com).

ERA (Earth Renaissance Action) – a dual-project program in cybernetics and environmental monitoring and control and the use of coordinated networks of autonomous and semi-autonomous robots and sensors in terrestrial and space operations. The fundamental control systems are based upon GHCM theory, architecture, simulation and future implementations. ASTRIC Project is focused upon principally space-based modular and cooperative robotics for assembly and construction, mining, and asteroid operations including collision deterrence. Tethys Project is focused upon environmental observation, sensing, monitoring and modification and includes technological focus upon intelligent agriculture and energy systems.

Main Projects:
ASTRIC (space-focus)
TETHYS (earth-focus)

(principal website: ASTRA Center: www.astra.tdyn.org, www.astric.tdyn.org, www.tethys.tdyn.org, www.tdyn.org/martindudziak)

PSED (Psychosocioeconomic Dynamics) – direct application of RTD theory and GHCM computing models and algorithms for mass-population predictive analytics and event forecasting and also providing informatic resources for social and psychological health, wellness and rehabilitation applications. Through the OASIS Project, applications are provided for social communications and intelligence development, implemented within the OASIS World system, a commercial implementation of internet-based, augmented-sensory experiential environment providing users with communications, collaboration, meeting and making, education and entertainment, and trading (COMET). PSED derivative-application include products and services for personal and business cybersecurity (Kyberos/Kybernet) enhancing personal and social health and rehabilitation that are delivered through the vehicle of the OASIS product offerings of IRI. Through the Seldon Project, derivative applications for mass-population predictive analytics and event forecasting are provided through the Seldon System and its applications operating on the internet.

Main Projects:
OASIS (internet social-engineering environment)
Seldon (prediction analytics engine)

(principal websites: TETRAD Institute: www.tdyn.org, www.oasis.tdyn.org, www.psed.tdyn.org; IRI: www.intelrenaissance.com)

LIBRARIUM – design, construction and support of digital and physical library resources for the conservation, preservation and sustainable open and universal availability of critical STEM, arts and humanities knowledge

resources for the long-term benefits of civilization. The contents and operational tools of the LIBRARIUM emphasize those knowledge resources which can enable a society, under even extreme stress and subject to extraordinary challenges, to reconstitute and rebuild its basic infrastructure for communication, collaboration, manufacturing, trading, and all aspects of life, with an emphasis upon agriculture, energy, health, and social integrity.

Main Project:
MIRNOVA (STEM education, training, apprenticeship and mastery)

(principal websites: TETRAD Institute: www.tdyn.org, www.oasis.tdyn.org, www.librarium.tdyn.org; IRI: www.intelrenaissance.com

COADUNATIO – seminars, workshops, conferences, symposia, focused upon small groups of people in physical attendance and larger numbers participating through internet telepresence, and with real-time and post-event media prepared and delivered to larger audience including students ranging from middle-school through university.

The principal events comprise the **TETRAD Seminars** – Primus, Astra, Mirnova, Oasis.

These have four general varieties, each with a focus upon the themes central to each of the two Institute component centers and the Institute as a whole. The main themes are as follows:

> **TETRAD PRIMUS Seminar** – physics, mathematics, complex systems and the interests of the PRIMUS Center.

> **TETRAD ASTRA Seminar** – space sciences, robotics, environment, cybernetics and the interests of the ASTRA Center.

> **TETRAD MIRNOVA Seminar** – education in science, technology, engineering and mathematics that is oriented toward agriculture, environment, and human social adaptation and sustainability to natural and social change and impact factors, with a focus upon practical training and career/vocation development.

> **TETRAD OASIS Seminar** – issues and challenges in social communication, collaboration, community development, cooperative business development, and the incorporation of education, entertainment including gaming, and creative trading and other economic forms of social interaction.

In addition, there are the **CANE Seminars** – the TETRAD Seminars in Complex, Asymptomatic, Novel, Emergent Disease, a series in development within 2020.

(principal websites: TETRAD Institute: www.tdyn.org, www.oasis.tdyn.org, www.seminars.tdyn.org, www.coadunatio.tdyn.org, www.caneseminars.tdyn.org

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