

Center for Exoplanetary Sciences and Applications

CEXO

A Preliminary work-in-progress Draft (version 1.0)
22.September.2015

Martin J. Dudziak, PhD
Institute for Innovative Study and The Exoplanetary Corporation
Ypsilanti, Michigan

Prefatory Notes:

Names can change. Acronyms can change. What matters is the Why, What, Who, Where, and How to make things Work. And keep on working. Not just for a 2, 3, 5-year duration program or center that is built around an often singularly available federal grant. This is obviously Something Completely (and decidedly, decisively) Different.

Fundamental Purpose, Objectives, the “Goal Set”, the Reason for CEXO:

Establish a sustainable private-public, academic-industry, profit-generating Program (the profitability base being through not only intellectual properties including patents, but through solid spin-out businesses and partnerships that will include legacy relationships and residual earnings), that becomes increasingly and rapidly self-sustained as a Research-plus-Clear-Applications Center, one that draws in creative students, researchers, teachers, and adapters, focused on several overlapping, interdependent and mutually synergetic Core Research Problems that all share and support Core Application Derivatives which will serve clearly identified and foreseeable needs of the near-term and long-term in different technology-business fields and also those ranging from near-term to ultra-long-term for Space Systems Development.

More Specific Mission and Activity:

A well-defined focus upon quantum computation and machines that will ultimately become compact, reliable and fault-tolerant, energy-efficient, economically feasible, embedded and networkable systems which serve applications in the tasks that comprise basic requirements for sustained activity by humans and robots in deep space including exoplanetary space - energy, propulsion and transport, structures and vessels, life support, exploration, mining, manufacture, assembly – and in those same application domains on Earth.

Example:

Suppose our concrete goal is to build what is in Arthur C. Clark's, Rama II or the film, Interstellar. Think about what you need. Now make sure that there are included applications and utilities that can be applied to something more “down to Earth” like manned/robotic exploration, terraforming and colonization of Mars and the Moon, and also Europa. Now make sure that there are things that can be applied to really down-to-Earth uses in the next 20 years, on Earth, pertaining to problems that we know definitely, now, with certainty, will be major problems that must be solved – in agriculture, energy, population growth, transportation, just to name a few such areas. Now you're getting it.

Mechanisms:

Organizational/participatory:

The Center is an entity that is independent of any one participant/member (institutional, corporate, individual). It is not limited to certain institutions and researchers (faculty, employees, students) but it starts with and keeps a particular “home base” focus upon the Midwest, and within that large geo-social space, Michigan, and further,

within that, Southeast Michigan. But CEXO is not closed to people, groups, projects, institutions, participation in general, from outside the Ann Arbor – Ypsilanti – Detroit Corridor. CEXO will grow, methodically, intelligently, drawing in and inviting those who fit into its Mission.

Is it non-profit, corporate, a foundation, etc? Wrong question. It is a Center that has some formal structure that suits the long-term goals and the agreements of the founding participants. It covers all the facets of what can come from the results of the research, engineering, teaching, and dealing. As a not-for-profit center it is as all such entities ought to be – profitable. As a for-profit venture generator, it is as all such entities ought to be – profit-focused.

What institution is in charge and responsible and controlling things? Also the wrong question. The Center is running itself but answering to all its participants, members, sponsors, supporters, investors, mentors. It does not belong to any one institution and no one institution is burdened with something new, heavy, cumbersome for its infrastructure and its budget.

Details will work themselves out when a few Individuals bring their institutions into the picture sufficiently so that the sponsors and interested parties with the ready Financial Support can then direct and define how things should be best configured for the interests of those making this possible and sustaining it in the years and decades to come.

Activity process:

The Center has a lean-mean core team that identifies, reviews, solicits, and guides the processes of aiding research projects and the collaborative engagement of different STEM people who work together on such projects. This team is charged with the project lifecycle management process that involves identifying and also cultivating sponsorship, support, funding of all sorts and types, from private as well as public sectors. This team is also charged with the project intellectual property and commercialization management process. This team involves people who are engaged in the different projects, and also specialists in the project development, management, and financial specialties, but all team members are also in different manners involved in parts of the actual STEM research and development. This way, all members within the Center are making contributions and gaining understanding and being creative and useful contributors to the overall efforts and activities.

All of the projects should be in some fashion symbiotic, synergetic with one another. They should produce things that also benefit each other and the global general targets and goals which can be (re)stated here as being STEM work that has application to:

- (1) space-based (exploration, discovery, commercialization, manufacturing, colonization, travel), and yes, within as well as outside the solar system, but definitely including in the long-term objectives that of distant exoplanetary activities. Yes, that means necessarily trans-generational, multi-generational, and ultra-long-term, and
- (2) earth-based, near-term, present-term challenges and needs which can be in any one or (preferably) several fields, such as: agriculture, aerospace, coatings, textiles, structural materials, semiconductors, transportation, computing, life sciences, civil engineering, power generation and storage, and more.

Examples pertinent to the above remarks:

Graphene, carbon nanofibers, composites of many types and genres, astrophysics and cosmology, quantum relativity, quantum biology, quantum computing, (ok, quantum-almost-anything), the mathematics to make better sense and completion for much of the former, improvements in optics and photonics, modeling of seismic and meteorological processes on other astronomical bodies (in our home solar system and on exoplanets), cryogenics, bio-cryogenics and life suspension, synthetic biology, genetics, embryology, agriculture, fusion, multiple propulsion technologies, and this list can go on further, certainly.

Summary answers to one word questions:

Why?

The human species needs to be developing Space, not forgetting about it or doing it half-heartedly, nor following the “same-old” approaches and methods, which is what we are still doing now and that includes several new for-profit private-sector space ventures. (For instance, rockets launched the way they still are from Earth are not the way of the future.)

Consequences? (of not doing more, sooner, re: Space)

Many dire possibilities, almost all with no specific dates in mind, but with inevitability and near-certainty. Furthermore, there are tremendous socioeconomic benefits from what can emerge if certain theoretical and several technological chasms and hurdles can be overcome.

Who?

Starting with participation by institutions and people at those institutions including: University of Michigan, Eastern Michigan University, Wayne State University, and certain companies and other institutions within the Ann Arbor – Ypsilanti – Detroit Corridor.

Where?

Initially, using entirely existing facilities. A coordinating hub with a small office and staff located at EMU or even off-campus Ypsilanti. Later, things grow and the Center and its participants and sponsors decide where to do that growth. Spin-off companies will include production (manufacturing, assembly) operations, and some of these will require physical plant space, of which there is plenty in The Corridor, and ample numbers of employees at many levels of skills and service, of which there are plenty of available people in The Corridor.

How?

Starting with setting things up in such a way that sponsors already in place and ready, both private and public sectors, as per the primary organizer (MJD) can direct funds and in-kind support through the already-existing standard channels (some of whom are listed further below in this document).

When?

Now is a better time than any other moment. There is no better alternative than Now if you want to Win Tomorrow.

What? (again, “coda”)

Focus upon quantum computation and machines that can ultimately become embedded and networkable systems which serve applications in the tasks that comprise basic requirements for sustained activity by humans and robots in deep space including exoplanetary space - energy, propulsion and transport, structures and vessels, life support, exploration, mining, manufacture, assembly.

Money:

More than enough ample suppliers of the funds needed for this, given the way it will be set up. This is not academic research grants the way it's been for decades. This is not Silicon Valley, either. Both are inappropriate and outmoded for The Future of Earth and Beyond.

But we begin with some confident, interesting and serious company (a few are listed here, in alphabetical order for simplicity, and all of this comes from working on this for years unceasingly, without stops or breaks):

Alphabet (Google), ABB, Battelle, CDC, CIA, Cargill, DARPA, DIA, DND, Ericsson, GE, Goldman Sachs, several notable Hedge Funds and persons associated with that financial sector, IARPA, IBM, Infineon, Intel, Kavli Foundation, Lockheed Martin, Microsoft, NASA, NIH, NSF, NRO, Northrop-Grumman, ONR, Paul Allen Foundation, several notable Private Equity Funds and persons associated with that financial sector, Proctor and Gamble, Raytheon, Simon Foundation, ST Microelectronics, Thermo Fisher, Wellcome Foundation, Wolfensohn Foundation, Xprize Foundation, Zeiss

Probably not the usual collection of sponsors that most readers of this document will have known, worked with or for, been funded by, or thought about for grants and contracts.

Contact Information:

M. Dudziak, PhD

martinjoseph@tdyn.org

martinjoseph@exocapfund.com

+1 202-415-7295 (mobile – voice/text/Viber)

Skype: martindudziak URL: (start with) <http://exo.tdyn.org>