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THE COPERNICAN EVIDENCE

(REQUIREMENTS FOR A SPACE AGE PHILOSOPHY)

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ABSTRACT

The present paper is aimed to provide some basic requirements for a new philosophic paradigm, called "Space Age Philosophy".

The paper is composed by 3 sections:

1. INTRODUCTION – taking inspiration by a Giacomo Leopardi's work, "*Copernico*"; I outline the scope of this paper: to show that there is a neglected nexus between Space Education and Philosophy, and to provide some indications about how to recover such a situation.
2. FOUNDING A NEW PHILOSOPHY – the Education strategies of the two main space agencies are shortly analysed and criticized. It is outlined, as well, the current major Philosophy (perception of the world) in the advanced countries, indicating the goal of a good education strategy: to favour the public achievement

of a more modern and realistic vision. Following up, fifteen basic requirements for the design of a Space Age Philosophy (SAP) are proposed, i.e. which results we should expect, from the settlement of a SAP. In a distinct paragraph, my personal Space Age Philosophy basic concepts are then sketched: the Open World concept, a philosophic reading of the nature of the conflicts after the end of the Cold War, the new economic-social paradigms required by the Electronic Age.

3. EDUCATING THE PEOPLE AND STEPPING TO THE STARS – the third section includes some concrete indications about the possible financing of the project, and a first draft list of activities to be actuated in two project phases.

GENERALITIES

About the author

Adriano Autino is an entrepreneur, president of ANDROMEDA s.r.l. (<http://www.andromeda-srl.com>), a small Company producing hard real time systems, tools and methodologies for the Aerospace Industry.

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Technologies of the Frontier on the web is a philosophical and scientific site, aimed to promote a new humanist philosophy and a new development paradigm.

Technologies of the Frontier, keeps cooperation relations with Space Age Associates (UK), SpaceFuture (Japan), Frontier Status (USA).

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INTRODUCTION

More or less two centuries ago, at the dawn of the industrial age, Giacomo Leopardi (an Italian Poet and Philosopher) wrote many very beautiful poems and philosophic works. Many of them should be attentively re-read, because they perfectly apply to our current problems. Reading materials and reasoning about the space education and its neglected nexus with philosophy, it came to my hands a Leopardi's piece named "*Copernico*"¹. I was so aghast by the topicality of such a work, that I had to refer it in the very beginning of this paper. Copernico is an imaginary dialogue between the Sun, the First Hour of the day, and Copernico himself: the Sun decided to stop going around the Earth, the First Hour (so concerned about the poor humans deprived of light and warming) was arguing with him. The Sun answers that, if humans want light and warming (we could say energy), they have now to provide themselves, and Earth shall start going around the Sun. The First Hour said nobody could convince Earth and Humans to start making all the work. But the Sun said yes, Poets and Philosophers can do it... and he suggested engaging Mr. Copernico, for such a task! The dialogue between the Sun and Copernico is also rich of wonderful concepts, i.e. the case for populating the other planets of the Solar System by people: if the other planets see Earth leaving its throne in the middle of the sky and starting to go around the Sun, they will want their own seas, mountains, rivers, and people, and houses! And if the other stars in the Universe will see that the Sun is sitting on a throne, with such a nice court of planets, filled of people, they will

want their own courts of inhabited planets! The Sun points out that, even if all the planets of the Solar System will become inhabited, he will still have energy enough, and will not be forced to work more than what he usually makes! Now, I don't want to damage the memory of Giacomo trying to translate its beautiful prose with my poor English, so I hope that some readers of this paper will find a good translation of the *Operette Morali* and read themselves.

What I aim to point out, here, are just two interesting connections:

- a) Vision of the world - At the times of Copernico, humans had a fully wrong vision of the world.
- b) Who can make the work - At the times of Copernico, the task to open the eyes of the people competed to Scientists, Poets and Philosophers.

At our time, we have exactly the same two problems: a wrong vision of the world, and we need someone able to open the eyes of the people.

The work of Mr. Copernico started a full revolution of the philosophy, and fully changed the vision of the world. He was helped by a sound physic fact, so big that the perception of the people was shocked, and became receptive to a new philosophic paradigm. At our time we don't have a fortune like that (fortunately we also don't have the Inquisition!). We have a harder work to do:

- First.** Founding a new philosophy,
Second. Educating the people.

FOUNDING A NEW PHILOSOPHY

The starting point

The space matters and disciplines are still mostly out of the governmental Education Systems. What exists now, for good and for bad, is in the hands of, and made by, the Space Agencies. So I firstly made a short tour on the web sites of the two major agencies (NASA and ESA), searching for education strategic statements, programs, and trying to detect traces of some philosophic thought. Quite disappointing. I found at least some strategic statements, but nothing about Philosophy.

At the NASA's education site, <http://education.nasa.gov/>, I learned the NASA's Vision for the Future: *To improve life here, to extend life to there, to find life beyond*. Nice, but why? And how? The *Leadership Strategies and Priorities* for years 1999 to 2003 are also three: (i) *Contribute to Educational Excellence*, as a *positive contribution to the goals established by the education community*. (ii) *Develop Alliances (...)* with key external constituencies.

(iii) *Involve the Education Community in the NASA mission (...)* we will actively engage students, teachers, faculty, schools, colleges, universities, professional associations, and national, state, and local education authorities. NASA also holds four *Operating Principles for Education Program*: (i) *Customer Focus (...)* to serve the needs of the education community, (ii) *Collaboration (...)* with a *wide variety of other educational organizations* (iii) *Diversity (...)* actively seeking qualified individuals and organizations from under-represented groups. (iv) *Evaluation (...)* The method is an Agency-wide, Internet-based data collection and reporting system designed for use in the field by the program managers and participants. The fundamental component of any NASA education activity is the content or knowledge derived from the NASA mission (...): *Aerospace Technology, Human Exploration and Development of Space, Biological and Physical Research, Earth Science, and Space Science.* NASA's education customer is the formal and informal

education community: *Community College, Undergraduate, Graduate, and Postdoctoral. (...) content (knowledge) derived from the NASA Strategic Enterprises is tailored to meet customer needs and is guided by curriculum standards for science, mathematics, technology, and geography at the national, State, and local levels. (...) The informal education community (...) includes science and technology centers, museums, planetariums, and other nonprofit education organizations.* The NASA education program and methodology are defined in six categories: *Teacher/Faculty Preparation and Enhancement, in science, mathematics, technology, engineering, and geography; Curriculum Support and Dissemination; Support for Systemic Improvement of Education; Student Support; Educational Technology; Research and Development.*

As it is repeated several times in all the NASA education programs and strategy, the contents are: science, mathematics, technology, and geography. No trace of philosophy. I had to make a search of the word "philosophy", by the NASA's site search engine, to find out some interesting pages, by George Farre (Philosophy Department Georgetown University), dealing with space and philosophy. The page starts with: *Space has deeply affected philosophy as the study of the truths or principles underlying all knowledge and being (or reality).* Sounds good! Surely a work worth to be studied, but we can't know whether NASA considers it strategic or not, if there are other studies on the matter, inside NASA or in the immediate neighbours. But definitely not an education content. The NASA's education strategy only focuses on scientific and technical matters, and doesn't care about philosophy at all. Furthermore, the education programme at NASA seems to be addressed only toward school and universities students, and not to other social ensembles (teachers, entrepreneurs, finance, trade-unions, etc...).

What about ESA? I went through several outreach/education ESA web pages, but I found few strategic/programmatic statements about Education. ESA created a dedicated office, the Education Office. From <http://www.estec.esa.nl/outreach/index.html>, I followed the "Office" menu' voice, and I found the four strategic areas: (i) *the inclusion of space-related topics in the curricula of students at all levels, and fostering the creation of possibilities for students to actively work on space projects before graduating.* (ii) *On the job training (...) for students* (iii) *Making students aware of the available technology* (iv) *Promotion of advanced information and communication technologies.*

On <http://www.esa.int/export/esaHS/education.html>, many pages are decorated by nice cartoons-like pictures: does it mean that space education is only for children? Following a link to "Our programmes" I found only an *ISS education initiative*. Does it mean that the whole ESA's education strategy focuses on the ISS? On, http://www.esa.int/export/esaCP/ESANNA094UC_index_0.html, a page dedicated to the kids, I found some basic questions and answers. Reading the answer

to the question *why are satellites or people going to space?* I learned that we go there in order to: *get a better view of the sun, the planets and the stars (without the atmosphere getting in the way); to permanently observe the Earth from above (aeroplanes have to land often for refuelling); to cover, all at once, parts of the Earth which are very far apart or very isolated (away from telephone or television links), by being very high above the Earth; to do scientific research in space, where the gravity that keeps us on the ground is offset by other forces (in space, without the motor switched on, everything floats).*

Of course all the above reasons are (also) true, and no doubts that space education has to be brought (at least) to young people. But, as we can see, the higher goals (human expansion, exploration, growth) are accurately kept out, almost if they were too heavy to burden the young minds by them! The ESA's education approach is far away from trying to educate the society. The young people are also very marginally touched by space education, because we don't see systematic lessons in the schools, nor some basic matters (i.e. Astronomy, Astronautics) were up to now introduced into the schools programs (at least in Europe). Maybe ESA was not enough active and diligent in its proposal to the Education System? Or the Education System was not enough receptive? But the whole scientific disciplines are neglected, in the education systems: for instance the history of Science and of Scientists is a very neglected topic. But this is still a wider matter.

What I saw last year in Toulouse, at the IAF 52 Education main conference, was a lamentation, by the Agencies and the biggest space dealers: not enough young engineers choose the space research or industry. And those few are not (technically) prepared enough by the school. But almost none of the speakers made a right diagnosis of such a situation: they mostly gave the guilty to the insufficient curricula. The problem is quite another one: 1) telecommunication – the magic piper of the millennium turn – was more fashion and more attractive than space 2) technology without philosophy ends to be a barren land, and youths don't love the barren lands.

The current perception of the world vs. a modern one

To bring a space vision into the society⁵ is surely a hard work. If we want to succeed, we have to deal with the really deep cares and heavy problems of humanity⁶, and to show how man can solve them only expanding to the space²⁴. And this is not only a matter to assure a better communication or to observe Earth from space (European vision), and also not only a matter of exploration (American vision).

The main problems are the development and the growth of the economy¹⁸, and of the human civilization: Philosophy, to the point. The solution is so simple – only space can provide energy and resources enough²³ for the

above goals for several centuries – and will be so hard to achieve, until when:

- Space will be perceived as an optional huge cost (a kind of super-toy for bored post-industrial old boys), and not as a mandatory investment.
- Space will be perceived as another pollution way, and not as the only way to start decreasing the pollution on Earth.
- Space will be perceived as another waste of energy and resources, and not as a near-infinite source of energy and resources, not burdening Earth.

Up to now, the Agencies – the only organizations in the position to address the big public opinion – weren't able to think and set-up a strategy to bring to the society a really enhanced perception of the space alternative. The current Education programs do not deal with Philosophy at all, thus they do not deeply affect the conscience, nor of the young students. So we can neither hope that, in some generations, things will change, if the approach remains the current one.

Materials and studies to build up a coherent modern vision of the world do not lack. We can surely start from the wide literature produced by the space pioneers, from Konstantin Tsiolkovskij to Gerard O'Neil, to Krafft Ehrlicke⁸, not forgetting many science fiction writers, which developed a high approach to philosophic themes in their works⁴.

Fifteen basic requirements for a Space Age Philosophy

I have personally many ideas about the needed new Philosophy, and I know some other students, around the world, that have ideas too. I do think that all the ones having ideas should be called to put them into a big forum⁹. In order to be fair, we could start defining some requirements for the new Philosophy (as we use to do when we start a technical project). Thus the first questions are: how should the new Philosophy be? What do we expect, as results, from it? Here after are some first answers:

- R1) The SAP must be the new ideological engine, valid for at least the first half of the new Millennium²⁶.
- R2) The SAP must aim to the sky and to the high frontier.
- R3) The SAP shall provide ideological tools to carry humans beyond the limits of their birth planet²⁷.
- R4) The SAP shall provide ideological tools to settle in the Solar System, turning into account its enormous resources and energy²⁰.
- R5) The SAP must be founded on a high humanist ethic, taking at the first place the intelligent life¹⁹.
- R6) The SAP shall prize intelligence and excellence¹⁷.
- R7) The SAP shall provide ideological tools to use the natural resources in a gentle and respectful way²⁶.

- R8) The SAP must achieve a fully new vision of the world: a fully Open World⁸.
- R9) The SAP shall provide ideological tools to allow the human economy and civilization to restart growing up²¹.
- R10) The SAP must provide ideological means to turn into account the whole human patrimony (near 7 billions of human beings and more)²⁸.
- R11) The SAP must be totally freedom oriented¹⁹.
- R12) The SAP must enhance the rights of the individuals, extending such rights to the whole planet and to the whole Solar System¹⁹.
- R13) The SAP must be fair, providing ideological tools to give education, information and commercial information to all the Terrestrials, giving it at lower price, or even free of charge, to the poorest ones²².
- R14) The SAP must provide ideological tools to eliminate all the commercial barriers, allowing all the Terrestrials to act and profit on a really global free market¹².
- R15) The SAP must provide ideological tools to help the free association and joining of strong industrial teams, able to collect the huge investments needed to open the space frontier^{30,32} in a safe way¹².

My Space Age Philosophy basic concepts in capsules

The Open World

My own ideas, about how to implement the above requirements, includes some basic discussions, the first of which is the vision of the world and of the relation between man and nature that followed the rise of the green movement²⁶. I start from a basic new-humanist concept: near 7 billions of human beings are the greatest richness that humanity never had. We need the help of everybody if we want to win the challenge. All these living Terrestrials (not an abstract concept of Humanity) have right to genetic continuation, and can find their dignity helping the greatest enterprise Humanity never tried: to win the gravitational well, and give birth to a Solar Society. If we will not be able to turn into account such a patrimony, it will become our ruin, and the time window to do it is not very large: maybe 50 years. After such a period, our growth in a closed system will cause our number to decrease, and decadence will be irreversible. At that point, we will never step on the path to the stars. In my conception, the Terrestrials are all precious: we don't know how many Einstein could be starving and dieing in the bidonvilles, while we already have many excellent intelligences coming from the "third world", in all the culture domains.

To me, the rational to open the world-system is simple and clear: we have to make room (resources, energy, space) for all the Terrestrials, in order everyone can have his individual right to work, to be rich, to be happy, to be free, to have and grow-up children.

The history of the human growth covers 200.000 years, and only in the XX century passed over 1 billion of human beings. The technologic history of Europe, compared to the one of China, let us understand that Europeans were growing in a relatively small space, so they were forced to a technologic development. China had a very large territory, and plenty of rivers, so they continued to use water machines for other centuries, while in Europe the steam engine was rising. The development of the Europeans in a closed environment made the pressure go up, and moved them to discover the new world, to have room enough. The planet became bigger, and the human civilization made an unprecedented cultural jump: the Renaissance, the Lutheran religious reform (that helped a formidable reevaluation of the scientific effort, of the culture and of the individual rights)³³. It was the cultural and ideological platform on which the industrial age would take place, in the XVIII, XIX and XX centuries: an extraordinary season of scientific and technologic conquests, leaded by the new world, incubator of a cross-fertilized society.

Nowadays we (Terrestrials) have all the same problems that Europeans had in 1400: we leave in a small world and we had a firing technologic development. The pressure (demographic and cultural) is going up more and more. Many comments speak about a "too fast technologic development, compared to a too slow moral development". To me, what we need is clear: a wider territory, plenty of "rivers" (read=energy), in order we can consolidate our technical advancement, and have room enough to enhance our ethic and freedom. A growing economy is the only means that can allow such a process: the competition will be fair, because resources, energy and markets will be wide enough to allow all the Terrestrials to get their freedom and to become rich. In few words: the civilization will restart to grow up. Any other path, resigning to the closed world philosophy, is a losing way: Humanity will start decreasing, technology will die, authoritarian "solutions" will take place everywhere, the medicine will give up, and terrible illnesses will drive the human race (or at least our civilization) to become extinct. If such a terrible scenario will take place, all the ones which today hope in the "demographic steady state" or decreasing, will see that their hope was a vote for the end of our kind.

But, first and only animal in the nature's zoo, the Intelligent Life holds means to go over its natural limits. While all the natural species begin their extinction when they saturated their ecologic niche, an intelligent animal can project and build the means to go over, and find a larger ecologic niche. The evolution of a species continues until it can grow up, and there's no reason why we have to stop our growth right now, just when we have the means to expand into – at least – the geo-lunar space. As we know, no other intelligent species leave in the Solar

System, thus I don't see any serious ethic obstacle, to expand everywhere in the Solar System.

We leave a season of paradoxes. An economic paradox: a finite loot (the planet Earth's resources) for a growing number of competitors. A social paradox: the highest aims of cultural growth in the time of the worst economic/resources chances. A philosophic paradox: death of utopias and "end of progress". A biologic paradox: human species will become extinct while it holds the best means of its history. A political paradox: survival of industrialist ghosts in the electronic society. An evolutionary paradox: while man reaches the technologic cultural means to be free, they are faced to new slavery and barbarianism in a closed world system. The solution of all the above paradoxes exists: to open the world system.

The above concepts, to me, shall come first and with a higher priority, vs. all the other high philosophic discussions², because they deal about our main problem: survival and development of our civilization. Of course I don't mean to stop discussions and teaching about – i.e. – the nature and methodology of the scientific knowledge, or the impact of the space exploration on the question between the dual model (mind and body) or the monistic (materialistic) one². Of course Copernico finished off with all the old-wised Aristotelian syllogism methods (A=A): it became obvious, when Earth was no more in the centre of Universe, that things in the same ensemble are not necessarily equal, thus each one is worth to be studied and analysed in details, to see whether it can give us something or to be dangerous for us.

And we know that all the Terrestrials so lucky to travel in orbit, fully change their vision of the world. So this is maybe the physic sound fact – the *Copernican Evidence* – of our age: let's help as many people as possible, to go there and see, how our planet is small in the Cosmos, how we are fragile and in danger until we live only on this planet, and how much we are burdening this planet, if we still claim to live all on the same small planet.

I found extremely few cases of space philosophy education. An interesting education program (that was applied at the University of Nebraska), providing btw some answers to environmentalist objections, is the one mentioned by Gonzalo Munevar and John C. Kasher (Philosophy and Physics Departments of the Nebraska University)³.

The group named "Greater Earth" held an interesting and fruitful email discussion in 1998-2000. Such a group, at the end of the work, agreed on the "Manifesto of the Greater Earth, concepts for a New-Humanistic Vision of the World"²⁹.

The nature of the conflicts after the end of the Cold War

But the *Space Option*²³ holds many ideological competitors, not only the green movement. The obvious fact (but unfortunately not so obvious for the most Terrestrial public opinion) that the space option is the only one that can allow the continuation of the human

civilization (that's why the Ehricke's concept of the *Extraterrestrial Imperative*² is nearer to the truth) will not give to the space option many chances to win, in useful time to enter our time-window to step to the stars. As it was another time demonstrated by the September 11th 2001, the religious thinking³⁵, particularly when it is integrist, ends to be the deepest ethic motor, able to orient the actions and behaviours of all the citizen of a social ensemble, be they religious, atheist, agnostic or anything else. But the problem are not only the integrist religious thoughts. We, western cultures, have to analyse attentively our creeds and behaviours³³. The definition of the religion given by the dialectic materialism – opium of the people – was incredibly superficial. Denying the individual thought, materialism asserted that the man's nature is fully a consequence of the society in which he lives, and of his/her economic situation². Of course there is a part of truth in such a view, or it was mainly so, during the industrial age, when the society was split in two main classes. But nowadays, being those classes on the way to be dissolved by Electronics¹⁵, we can see that the real differences were maybe other ones (not only or not mainly the class difference): there's not so much difference between the Catholic thought and the Socialist one. Both are based on the ethic of the sacrifice (of the individuals) for the wealth of the community³³. Both are available to have bureaucratic intermediaries between the individuals and God, or Government. Both see with suspect any rich people. There's not so much difference between the Liberal Thought and the Protestant one³³. Both prize the success, and appreciate the individuals that were able to build their own fortune. We could say, that the Catholic-Socialist societies don't tolerate to win (it is a too egoistic and superb thing), while the Liberal-Protestant ones don't tolerate to loose (the loser is not selected by God, his bad fortune testifies his bad soul). Both such behaviours can be a serious philosophic obstacle on the path to the stars, because they can perpetuate old-wised conflicts and misunderstandings. The problem is that, while all the sociologists, anthropologists and commentators are ready to discuss about the Islamic religion and the related behaviours, a very strong taboo seems to prevent any analysis of our own religious and ethic behaviours. It is not a matter to deny the religion (to deny the spirituality leads to very bad results, as the "real-socialism" society taught us). But it could be time to try taking the best of each religious thinking³⁴, to really honour the word *religion*, from Latin *religere = to unify*. What could it mean to unify, better than to take the best ethic contribute from each social ensemble? Let's say, to simplify (this paper is not the right place to deeply discuss such a matter), the rights of individuals from the Lutheran society and the spirit of solidarity from the Catholic one? No: don't be too quick saying that they are in contradiction! When a real cross-fertilization occurs, between two apparently antithetic vectors, many very interesting and unpredictable things happen, and many unpredictable solutions can be found! If such a high example will take place, many other people will take courage, and start to think that they have to bring their ethic contribute too, instead of bringing bombs

or to remain neglected and silent, or to migrate from his land³⁷.

The Electronic Age

The Industrial Age cost a tremendous price in human lives, alienation, sufferance and exploitation. But such a sacrifice (!) was not useless, because it created the technologic platform for the Electronic Age¹⁵. With the Electronic Age the old big factories are disappearing, the number of small companies increased of several magnitudes in all the advanced countries, the classes are dissolving, and the people is continuously socially growing (from the status of dependent workers to the one of entrepreneurs). Is it really so? Of course not, because we are not able to analyse the social processes while they are going on¹¹. Our method is not dynamic enough. Therefore, though Electronics and Automation make a great part of the job, we are desperate – while we all could be very much richer than in the previous age – and we are perfectly able to give a kick to all these wonderful opportunities, and to live in a continuous anxiety, because we are not able to understand that an increased number of companies requires a fully new and stronger kind of marketing, in order that all the good companies can have works to do, and that all the bad companies can promptly die, thus liberating forces to reach the good ones¹⁰. The old social paradigms are still on the scene, making us believe that "the factories shall be filled again", and the phantoms of employment and unemployment still work on TV, to bring votes to rightists and leftists politicians³⁸. Of course the taylorist job became extinct, and no cloning process can take it in life again! So, where is the work? Of course we have a lot of works to do²⁸, and problems to solve, in fact the number of problems is exponentially increasing, while we trek on the way of growing up in a closed system! The current challenges require more and more brainwork than manual work. The main problem, thus, become the one to interface different social ensembles, in order to allow cross-fertilizations. And, also, to allow billions people to try to help solving the problems. Now, we are not technologically unprepared to this, because we have the network! The logic step is the one to use the network, not only to sell things to the whole planet, but also to buy solutions from the whole planet. I wonder to see the first site that will put online a problem, promising (in the order): (i) letting a contract to the first 3 best solutions, (iii) an interesting money prize to the following 10 selected solutions, (iv) a participation prize to the following 100 ones. The above is the only possible social paradigm, for a society where we want intelligence and thought excellence be more and more prized and leading: Pay-For-Thinking. The exact opposite of the Work-For-Few, leaving in blockhouses, with endless bidonvilles all around³⁸.

In such a vision, Education has a key role³⁹: even the geniuses could quickly disappear, and go back to invent odd ways to get by, instead of help solving the Humanity's problems. Education is the key to start a really free market of the ideas, competences, skills and solutions⁹. In such an environment, an incredibly huge

number of geniuses will leave their odd ways of leaving, and start to produce billions of excellent solutions. Let's think that we are near to 7 billions, and we didn't yet start to pull out our excellence! To win the gravity well in

an economic and profitable way will then be a matter of few years, maybe months.

EDUCATING THE PEOPLE AND STEPPING TO THE STARS

The path is now clear, we have to:

- (i) change our set-up, acknowledging the role of Philosophy;
- (ii) design a new Philosophy, equal to the task;
- (iii) change our Education strategy, acknowledging that we have to educate the society, because we have no time to only wait for new generations to grow up;
- (iv) design a valid program;
- (v) develop the program.

Financing the program

Yes, you are true: when I say "we" it is not clear whom do I mean. Well... it is not so clear even to me! What is sure is that I don't put any barrier or selection criteria. I would say: all the good willing people who feel such a task as the priority, be they belonging to space agencies or not, educators, students, entrepreneurs, scientists or simple citizens.

OK, but who should organize such a work? Who will provide a budget? Who will recruit the manpower? Don't claim too much, by me: by now I was able to think about the task, in order to organize the work of course I need help!

As to the money, I have no prejudice: to use public money (from Agencies, and why not from Education Government Departments) would be, for once, a worth way to use public money¹⁰. Of course private investors would make a very good investment: royalties on the Pay For Thinking business could pay them back, by now. Of course the first investors that will trust in such a new deal, will have the chance to qualify for the new space industrial teams.

The 1st phase

To start, two good willing people, let's say one in NASA and one in ESA, could decide to put together even a modest budget, enough to assemble a small project

team, and to develop a concrete program and an initial business plan. The budget should cover, most of all, the following activities, performed by a first group of seekers:

- a) Feasibility analysis.
- b) Design of a detailed program.
- c) Implementation of a web site, where the SAP requirements will be online, on an open forum, where the interested philosophers can add their suggestions, comments and contribute to the building of the new philosophy (this would also be, having a dedicated budget, the first experimentation of the Pay For Thinking method).
- d) A preliminary investigation in the following environments: (i) the Space Agencies (ii) the Education Government Departments in EU and US (iii) the main Chambers of Commerce in EU and US. The goal of the investigation would be to find other financial resources to budget the 2nd phase.

The 2nd phase

The 2nd phase will deal with the following activities:

- a) Advanced design of the Space Age Philosophy.
- b) Recruitment and training of a bigger number of educators.
- c) Tour of conferences in all the major Terrestrial Universities and Chambers of Commerce.
- d) Organization of new industrial teams, working with the Pay for Thinking method, targeted to the space frontier (i.e. geo-lunar space industrialization⁸, space tourism³¹, solar power from space, passenger space travel, orbiting and lunar passengers accommodations, etc...)

REFERRED DOCUMENTS

1. Giacomo Leopardi – "Il Copernico"
2. George Farre (Philosophy Department Georgetown University) – "Advances in Scientific Knowledge and Implications for Philosophy"
3. Gonzalo Munever and John C. Kasher (Philosophy and Physics Departments University of Nebraska, Omaha) – "Teaching Experience, Course Content and Bibliography"
4. Philip R. Harris Ph.D. (Harris International LTD. LaJolla California) – "Millennium Challenges for Living and Working in Space"
5. Marco C. Bernasconi – "Three Levels for Astronautics" http://www.tdf.it/english/3astr_en.html
6. Marco C. Bernasconi - "Why implementing the Space Option is necessary for Society" - The OURS Foundation - 48th IAF '97
7. Krafft A. Ehricke "The extraterrestrial imperative: Why Mankind Must Colonize Space" - Talk November 1981 New York, last step of a European tour for the Fusion Energy Foundation
8. Krafft A. Ehricke "Industrializing the Moon - the First Step into a New Open World" - December 1981 FUSION
9. Adriano Autino – "The methodology of questionnaires to develop a world wide space education plan" - <http://www.tdf.it/Italy/is/iaf52doc.htm> (paper presented at the 52nd International Astronautical Congress - Oct 1-5, 2001 / Toulouse, France)
10. Adriano Autino – "New credit tools and tax concepts for the opening of the space frontier" - <http://www.tdf.it/english/is/iaf51aa.htm> (paper presented at the 51st International Astronautical Congress - Oct 2-6, 2000 / Rio de Janeiro, Brazil)
11. Adriano Autino – "It will not be the rational individualism, alone, to take us to the space" - http://www.tdf.it/numero1/edit101_eng.htm
12. Adriano Autino – "Where is the free market?" - http://www.tdf.it/numero1/mer_eng.htm
13. Adriano Autino – "Near, neighbour, rather Proxy" - http://www.tdf.it/editoriali/proxy_eng.htm
14. Adriano Autino – "Internet, the poet and the astronaut" - http://www.tdf.it/editoriali/new_economy_eng.htm
15. Adriano Autino – "The Electronic Society looking for new political points of reference" http://www.tdf.it/editoriali/editoriali/elezioni_eng.htm
16. Adriano Autino – "The law of the greatest" - http://www.tdf.it/editoriali/editoriali/Grande_eng.htm
17. Adriano Autino – "An analogue and human Millennium is born" - http://www.tdf.it/editoriali/editoriali/Millenni_eng.htm
18. Adriano Autino – "The end of the Economy(cs)" - http://www.tdf.it/editoriali/editoriali/Fine_economia_eng.htm
19. Marco C. Bernasconi – "Astronautics: The Only Ethical Future" - <http://www.tdf.it/english/pph9925.htm>
20. Marco C. Bernasconi – "The ESA Workshop of Space Exploration & resource Exploitation (A First Report)" http://www.tdf.it/english/xplos_1.htm
21. Adriano Autino – "A Plan for the Mercantile Astronautics" - http://www.tdf.it/english/iss99_e.htm (paper presented at the International Symposium on Space Travel Bremen, Germany, April 21 - 23, 1999)
22. Adriano Autino – "Concepts for a World Space Program based in the Society" - <http://www.canavese.it/autino/iaf49aa.htm> (paper presented at the 49th International Astronautical Congress - Sept 28-Oct 2, 1998 / Melbourne, Australia)
23. Marco C. Bernasconi – "21 Century & Space Options" - <http://www.tdf.it/english/PPH9827F.html>
24. Don Wesby – "Unsustainable civilization?" - <http://www.tdf.it/english/debate.htm>
25. Michael Martin Smith "Salto nello Spazio" - published in 1999 in Italy by Tre Editori (Roma)
26. Adriano Autino "Some Concepts for a Neo-Humanist Philosophy" - <http://www.tdf.it/english/s4e.htm>
27. Adriano Autino "Beyond the limits of development" - reflections on the meeting "10 Nobels for the Future" held in Milano 1996 - http://www.tdf.it/english/editoriali/nobg_fr.htm
28. Adriano Autino "Labour and unemployment: a philosophical problem" - Technologies of the Frontier - http://www.tdf.it/english/editoriali/occc_fr.htm
29. Autino, M. Martin-Smith, D. Christlein, A. Woods, M.C. Bernasconi - "Manifesto of the Greater Earth, Concepts for a New Humanistic Vision of the World" - http://www.greaterearth.org/ge_manif.htm
30. Dale M. Gray - Imponderables - http://www.tdf.it/english/umani/Imponderables_eng.htm
31. Patrick Collins - Space Tourism and Space Power - http://www.tdf.it/english/is/PC_IAF50_eng.htm
32. Dale M. Gray - America and the space frontier - <http://www.tdf.it/english/umani/Frontier%20Corner.htm>
33. Diana Baroni – "The Catholic creed prizes the sacrifice, the Protestant one prizes the success." http://www.tdf.it/numero2/Filosofia/Confronto_eng.htm
34. A. Autino – "Is it possible a fruitful interface between the Latin-Catholic cultures and the Anglophone-Protestant ones?" http://www.tdf.it/numero2/Filosofia/Interfaccia_eng.htm
35. A. Autino – "But the culture of the infanticide belongs to the monotheist world" - http://www.tdf.it/n1_2002/infanticidio/infant_eng.htm
36. A. Autino – "The integrisme lives here" - http://www.tdf.it/n1_2002/integralismo/Integr_eng.htm
37. A. Autino – "Migrations and Development in the Space Age" http://www.tdf.it/english/editoriali/migrat_e.htm
38. A. Autino – "Article 18, a false problem" - http://www.tdf.it/n1_2002/articolo%2018/art18_eng.htm
39. A. Autino – "Our Approach to Education" - <http://www.andromeda-srl.com/Astronautics/Edu/Approach.htm>