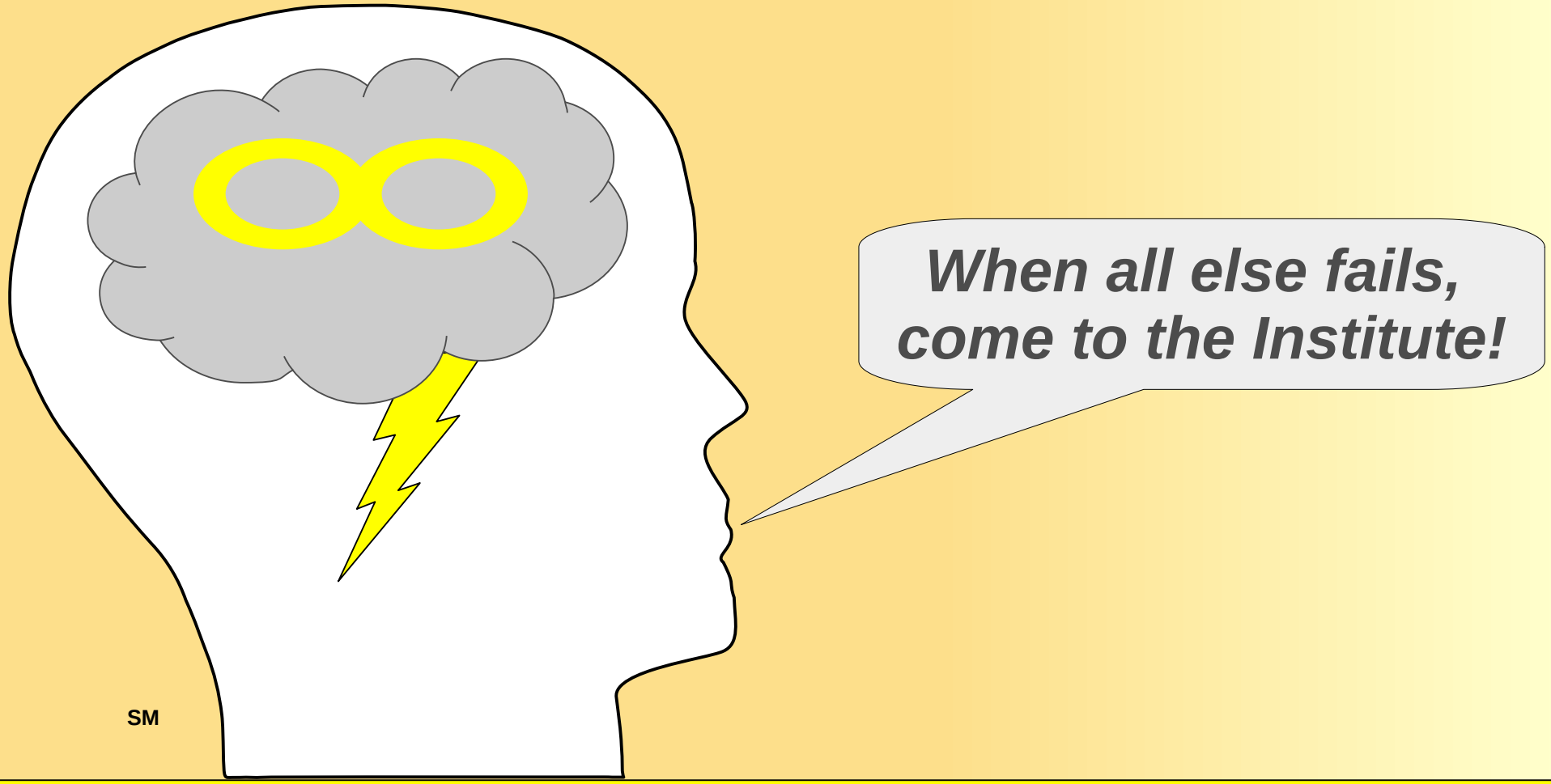
INTRACTABLE STUDIES INSTITUTE

IntractableStudiesInstitute.org



We are a consulting think-tank, specializing at solving ONLY the most difficult intractably hard problems that others can't solve, providing theoretical solutions and designs. - Director

Mission of the Intractable Studies Institute:

The mission of the Intractable Studies Institute is to create and publish solutions for the most intractably difficult challenges. We are a consulting think-tank for theoretical solutions.

Motto:

When all else fails, come to the Institute!

Founding:

The Intractable Studies Institute was founded on June 5, 2013 by Patrick M. Rael. It is dedicated to working exclusively on the most difficult problems known. These are the problems that nobody else can solve, or cannot solve well.

Independence:

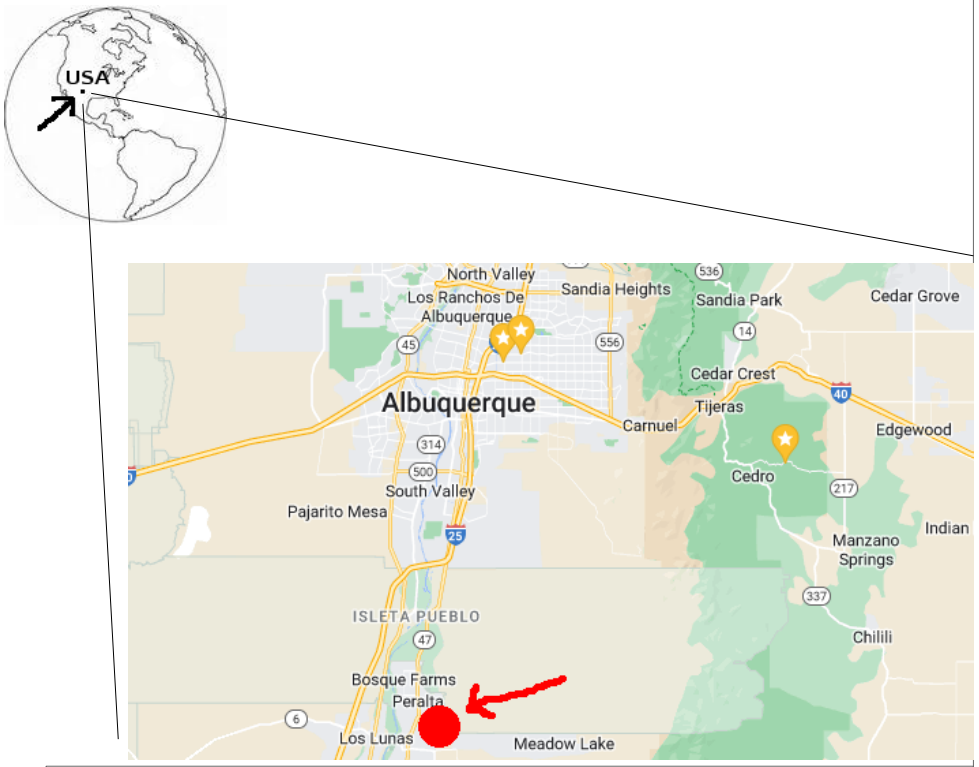
The Intractable Studies Institute is an independent research institute. We are not affiliated with any external entity. This gives us the flexibility to have maximum creativity which is necessary when working on challenges that are intractably hard.

Director:

Patrick M. Rael, Bachelor of Science, Computer Science, The University of New Mexico, 1990, USA.

Solution Methodology

The Institute identifies a problem, finds our best solution, then publishes that as “theoretical” without proving nor peer review. This is not complete science. The Institute is intentionally designed this way in order to find solutions to 51 intractably hard challenges in just a few short years. This method will allow us to succeed. We admit up front that we operate in theoretical space.



Location:

Headquarters:
Peralta, New Mexico, USA, North America,
Earth, Sol, Orion Arm, Milky Way, Virgo Supercluster, Laniakea Supercluster, Universe.

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Hours of operation: Not open to public.

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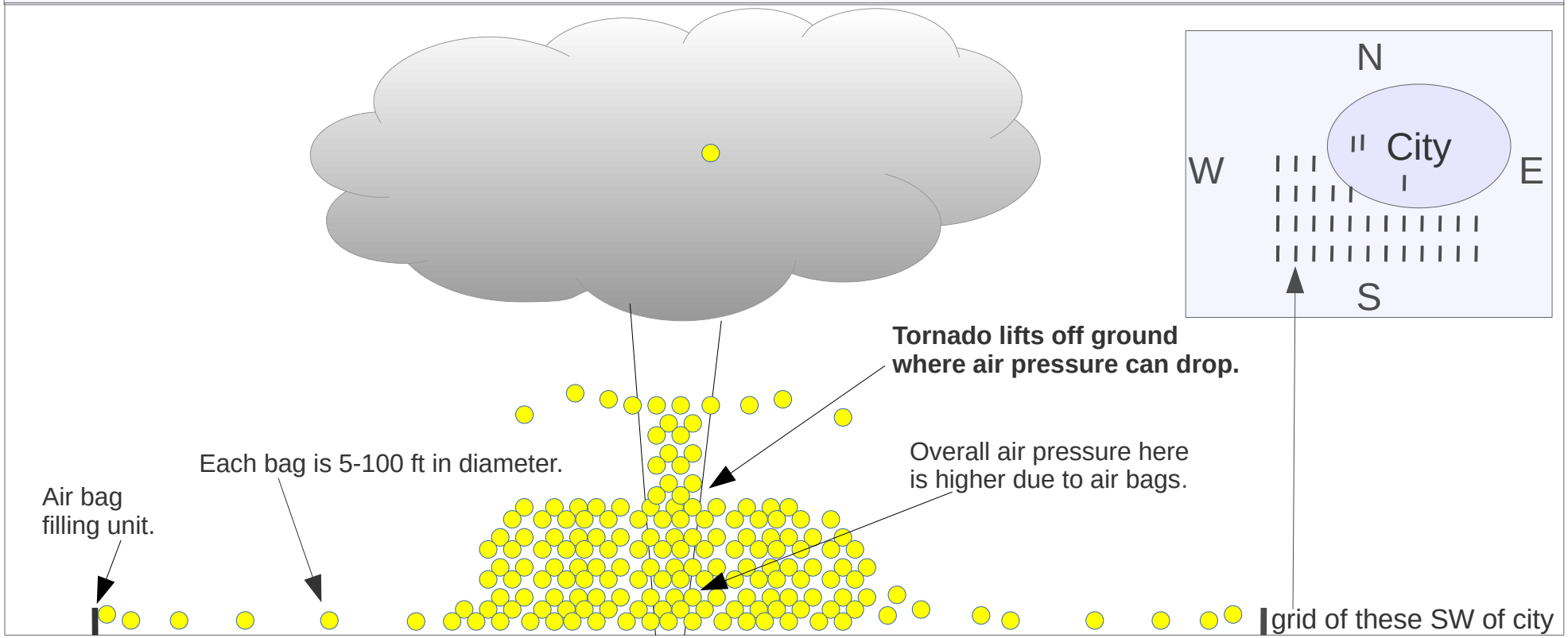
How to Disrupt a Standard Tornado

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Tornadoes kill people and destroy property. The May 20, 2013 tornado in Moore, Oklahoma killed 24 and caused an estimated $1.5-2 billion in damages. There are several approaches towards disrupting a tornado. Model a tornado, identify the variables, constants and assumptions, and then change the model until the tornado is disrupted. One technique is to analyze the properties of the air as it is drawn towards the funnel and then enters the funnel. This air always goes from higher-pressure surrounding air to lower pressure inside the funnel. To disrupt the tornado, do not allow the air to do this. One approach is to create numerous volumes of air which cannot decrease in air pressure. Round air bags can achieve this. An auto-filling air bag device can be powered by the wind of a tornado. A device of minimal size (5 foot diameter and 10 feet tall) can hold perhaps 1,000-10,000 air bags. High winds activate it, an air catcher fills air bags which then tie off rapidly several per second proportional to the air velocity. The natural inflow of air to the tornado moves the air bags to the funnel. Some air bags go up the funnel. When enough air bags reach the tornado at the ground they cause an air pressure not as low as without the bags. This air pressure higher than what the tornado needs at ground level weakens the tornado at the ground. The funnel will continue strong above ground but not at the ground level where the damage occurs.



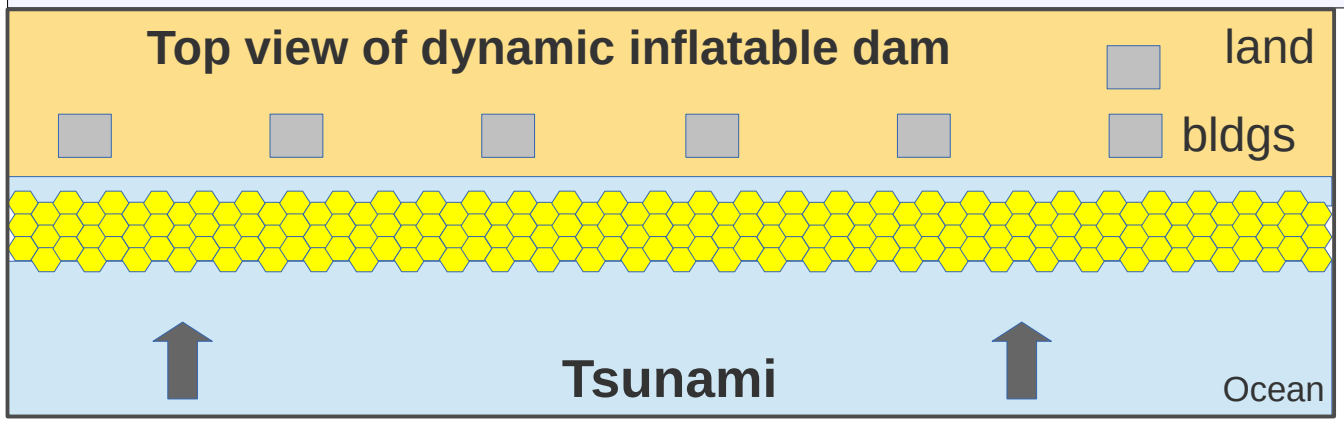
No. 001, 2013-01-04, revised 2024-10-15

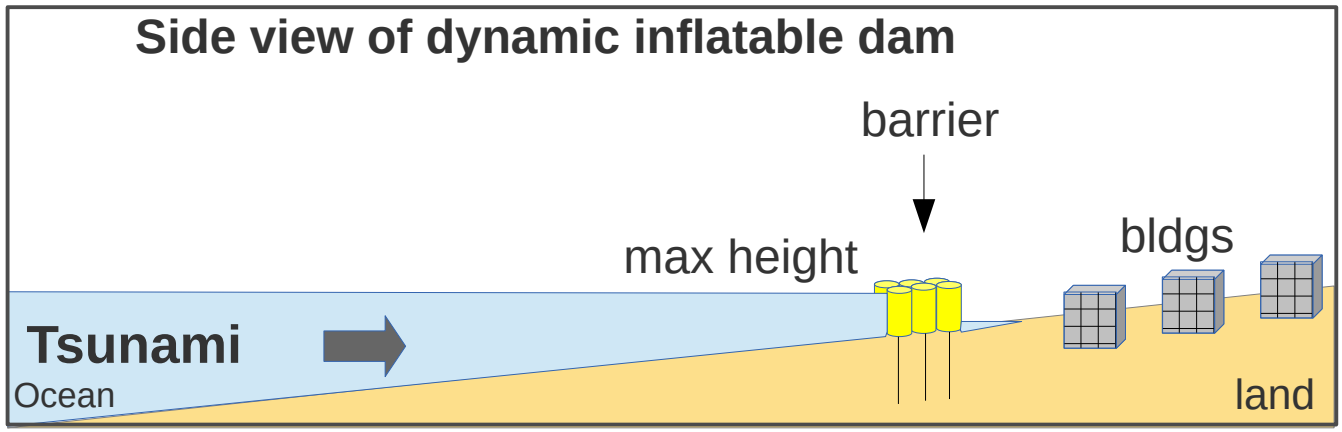
A Design to Stop a Tsunami Wave

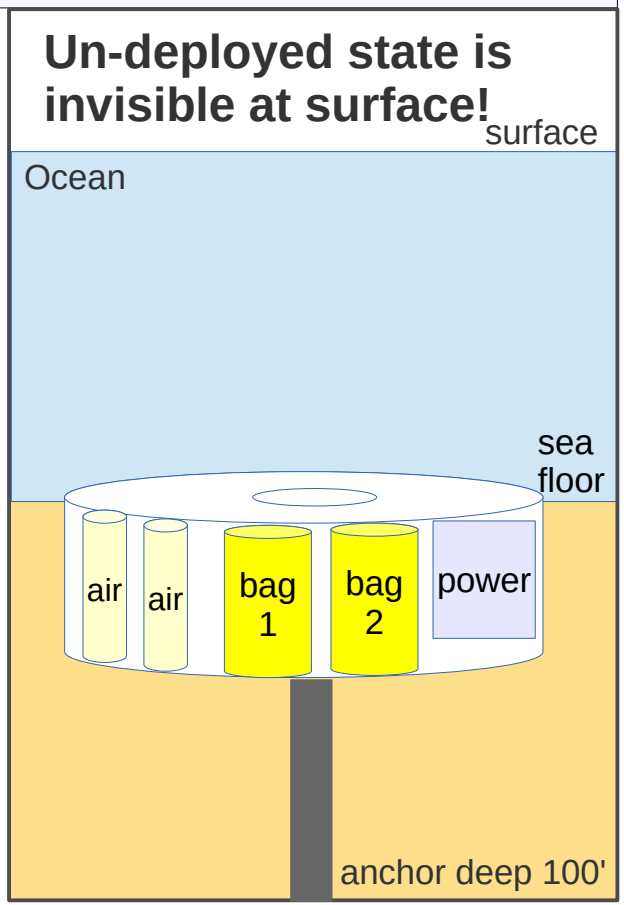
A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Pre-installed deflated air bag units are installed just offshore anchored deep in sea bed in a grid pattern. The grid pattern has offset columns to cause the honeycomb shape for horizontal reinforcement. The interlocking air bags closest to the beach support the bags farther offshore. The pressure on the air bags in contact with the tsunami is distributed evenly among all interior air bags. Increasing the number of rows strengthens the barrier, Each unit is anchored deep enough to prevent it coming loose. The air bag is made of a kevlar-like durable material. When a tsunami warning is received, the air bags are sent a signal to inflate self-powered. Self-powered makes them robust. They inflate rapidly, perhaps in 30 seconds. Each bag is shaped like a cylinder with designs that retain this shape. When bunched together tightly at maximum inflation the internal bags naturally form up like a hexagon and it appears like a honeycomb. When the last wave in the train subsides, the bags are sent a signal to deflate. When deflated they are not visible. Impact of the 2011 Japan Tsunami is 17K dead, 200+B US; 2004 Indonesian tsunami >226K dead, 7.5B US.







No. 002, 2013-08-27, Revised 2024-08-02

An Auto-Extinguishing Floating Oil Platform Design

A Communication of the Intractable Studies Institute

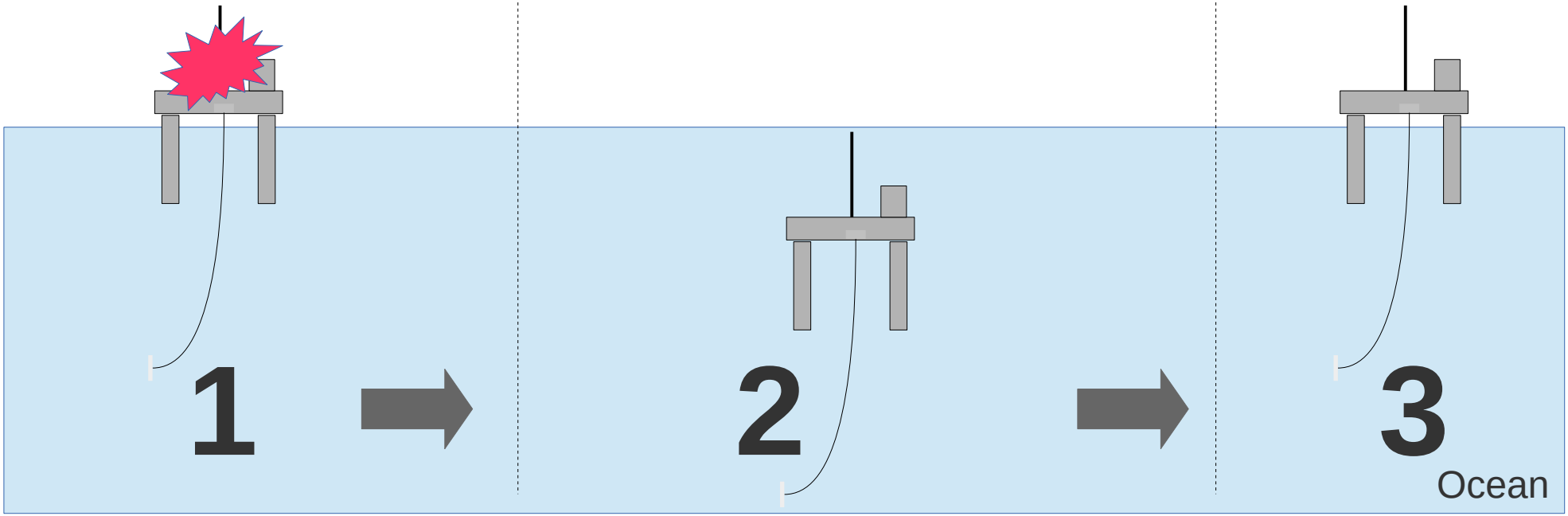
Patrick M. Rael, Director, IntractableStudiesInstitute.org

Floating oil platform fires can be difficult to extinguish using techniques such as water hoses. An explosion my precede the fire which can disable all platform operating machinery, and can even kill all personnel leaving nobody to fight the fire. Although external ships can approach the platform and spray water, as was evident in the BP oil platform catastrophe, even several ships were insufficient to put out the blaze and the platform sank. It should be noted that once the platform was under water, the fire is out on the platform. Some surface fire can remain but is easier to extinguish because it is planar on the surface of the water and foam is very effective there. A design for an oil platform that can robustly handle any fire on it would allow the entire oil platform to submerge automatically in the case of a fire (unless personnel hit the submerge-override switch). It is important for the submerge operation to initiate automatically in a fire and not under human control since all platforms workers could be dead from the blast. Foam is created on the surface automatically to put out any surface fire. Once submerged, a robust mechanism not dependent on power then flips and the platform rises back to the surface. Although water-damaged, the oil platform survives. The cost of the 2010 Gulf of Mexico spill; +40B.

Oil platform is on fire. Submerge initiates automatically in 1 minute unless overridden.

Oil platform is submerged. Fire is extinguished by ocean. Re-surface operation is initiated automatically without human intervention.

Oil platform is back on surface, Some damage but it is saved.



No. 005, 2013-08-27, Revised 2024-08-02

A Solution to Coastal and Flood Plain Flooding

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

A house in a flood-prone area can be designed to float above the water like a boat. Such a house would rise and fall with the water. Dynamic “anchors” can be designed which allow vertical rise/fall motion, but prohibit horizontal motion. A loop around a pole is the most basic attachment, but rollers move smoother as in the Thailand example below. The anchors poles can be telescoping. This kind of house can be designed to appear externally as a standard house. The advantages of a house that floats are obvious:

- no flood damage to house
- no flood damage to vehicles
- reduced insurance rates for flooding
- minimized regional catastrophe and costs (~$50 billion allocated in 2013 for Super-storm Sandy)
- flooding becomes boring

Current house technology on the coastal plains and flood plains is not designed to float above flood waters. A transition phase across a generation (25-40 years) can occur so as to gradually cut over to the new floating design. Rules can be made such that a house flooded once, or twice, in 10 years must be replaced with a floating design, forcing a cut-over to eliminate repeat-flooding.

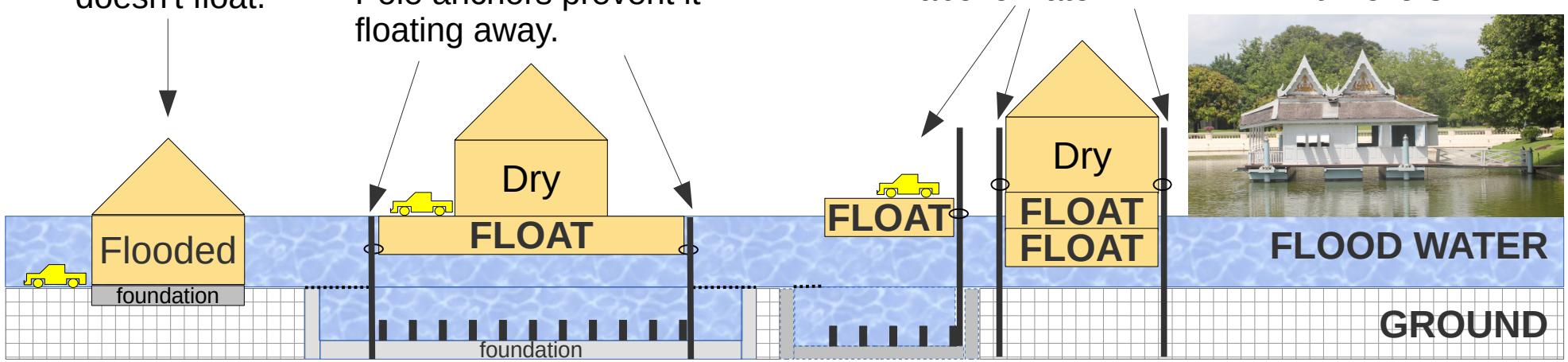
A competition phase for architects to design such floating houses can be used to focus action on this recurring problem. Competing designs and models with varying costs can become available allowing home owners to choose the right model for their budget. There's no need for 1-size fits-all when creativity can be used for multiple solutions.

Static house floods, because foundation doesn't float.

Dynamic floating house rises with flood water. Pole anchors prevent it floating away.

Dynamic stilt house and car-float floats above water

Floating Thai house, 4 corner post anchors with rollers.



No. 027, 2013-01-06, Revised 2024-08-02

How to Scale Aerial Tanker Water Drops to 100X

A Communication of the Intractable Studies Institute

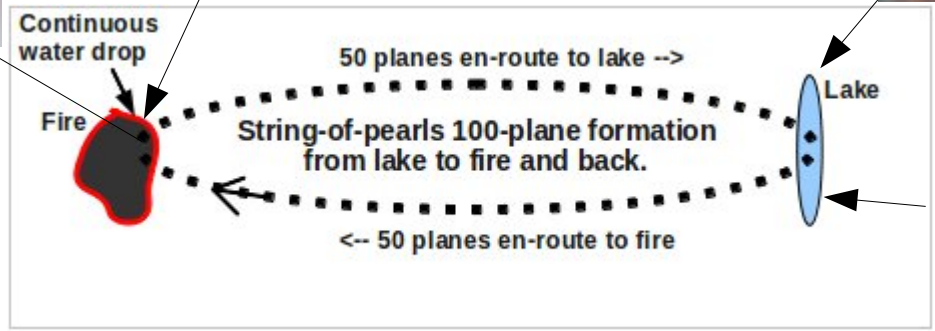
Patrick M. Rael, Director, IntractableStudiesInstitute.org

Fighting forest fires of any size can be simpler if a well-known solution is **scaled** very high. The flying water tanker method can be scaled very high to drop an **overwhelming** amount of water on a fire. A specific flight pattern known as the **string-of-pearls** should be used when the number of tankers is >50 to provide a **continuous water drop** on the fire and to prevent air collisions of the tankers. In the example below, 7,200 gal tankers are scaled to drop **7200** gal/drop x **4** drops/minute x **60** minutes/hour = **1,728,000 gal/hour**, dwarfing the DC-10 and 747 hourly rate. Tanker models vary, a specific one below is shown in pictures with characteristics. Regardless of the tanker model, the flight formation described scales volume/time drops very high. Five Western forest fires from 2000-2003 cost directly 230M dollars, indirectly 2.9B as per http://www.blm.gov/or/districts/roseburg/plans/collab_forestry/files/TrueCostOfWilfire.pdf. The cost of a large squadron can be distributed among states and nations. This fleet can be internationalized to share costs and scale the number of planes high, such as ¼ of the fleet in Australia contributing off-season.

The Coulson-Martin Mars JRM-3 water tanker has these flight characteristics (no longer manufactured, but conceptually sound):

- Maximum speed: 221 mph, 356 km/h
- **Cruise speed: 190 mph**, 305 km/h
- **Range: 5,000 mi**, 8,000 km
- Service ceiling: 14,600 ft (4,450 m)
- **35 second water pick-up refill skimming a lake NON-STOP!**
- 7,200 US gallons of water payload (144 50-gallon drums)
- can be mixed with retardant or gel on the fly

A water drop every 15 sec. Next water drop starts before prior finishes hitting ground.



Non-stop refill skim in 35 sec

The fleet of air tankers can be based in a lake to avoid airport traffic.

No. 004, 2013-01-16, Revised 2024-08-02

UTOPIA Androidia – A Solution to Labor and Retirement

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Through the use of the general-purpose android and some structural Laws, it is possible to design a **revolutionary labor system** in a Utopian way. UTOPIA Androidia **combines 1 human with 1 android into a working pair** which have a **combined work week of 40 hours**. The brief version of the UTOPIA Androidia follows:

Law 1: Right to be paired with Android.	**Law 9: Human Education, Teachers and Professors.**
Law 2: Participation - Automatic at birth to death.	**Law 10: Youth-E Funds for Education.**
Law 3: Work Week - 40 hours/week combined.	**Law 11: Mechanical Immunity - Android cannot be sued.**
Law 4: Combined Salary to Human	**Law 12: Human Right of Way, robots can't replace humans.**
Law 5: Android Supply - Never a shortage of androids.	**Law 13: Android Equality – Equally skilled androids perform equally.**
Law 6: Tax.	**Law 14: Minimum Human L3 Score on L3-IQ-Scale.**
Law 7: Non-Slavery Clause - Non-Sentient android.	**Law 15: Maximum Android Skills and Knowledge Capped.**
Law 8: Employed consistently.	**Law 16: Non-Inheritable Education funds at death.**

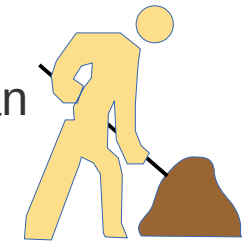
Note about Law 7: The robot paired with a human leads a laborious life. It legally cannot be fully sentient: If it was fully sentient, such a labor-intensive life has a name: Slavery. We do not want to make that error. Therefore, ONLY non-sentient androids can be paired w/humans. A fully sentient android will eventually need a labor robot working for it so that the sentient robot can also benefit from UTOPIA Androidia.

A labor system based on the UTOPIA Androidia design has human beings working less hours yet getting full pay. Also revolutionary is there is **no need to save money** for retirement nor pay into Social Security nor IRAs nor pensions because **the robot half of the paired labor NEVER RETIRES!**.

- Humans and androids (humanoid robot) work as pairs with a required combined 40 hour work week.
- Human beings work less (or as much as they want), typically 20 hours/week for human, 20 for android.
- Social Security, pensions, IRAs **all become obsolete** since the robot continues working (somewhere) without retiring.
- All disabled worker benefit systems become obsolete since the robot continues working.
- The android is paired with human after high school graduation through final death, always working. At human death the robot is paired to another.

Current Labor Now

Human

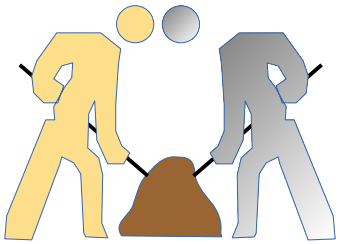


1. Age 0~18: should not work, but some do.
2. Age 18~65: works <=> 40 hours/week.
3. Age ~65+ : should retire but some must work.

Future

Paired Labor of UTOPIA-Androidia

Human



Android

1. Age 0~18: Child does not work, *-bots work.
2. Age 18~50: Pair works 40/week, human max 40.
3. Age ~50+: Human retires, robot keeps working.

No. 006, 2013-06-03, Revised 2024-08-14

How to Obsolete Social Security, Pensions, and 401(k)/IRAs

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

The Challenge and a Solution

The current retirement models have an assumption which until now has been correct: starting about 50-70 years old most workers become increasingly less able to perform their work tasks efficiently. Retirement allows the worker to quit working and receive a minimal regular paycheck. This assumption can be overcome many ways. One way is to redefine what a worker is.

If a worker is re-defined as a combined pair of 1 human and 1 android which together do the work assigned to a single worker, then this “worker” can overcome the inability to work in their elder years. The robot simply performs the work that the human no longer can do. As humans enter their elder years the human may start doing slightly less work, increasing to much less work, and finally cannot perform any work. The robot half of this worker-pair simply takes up the slack.

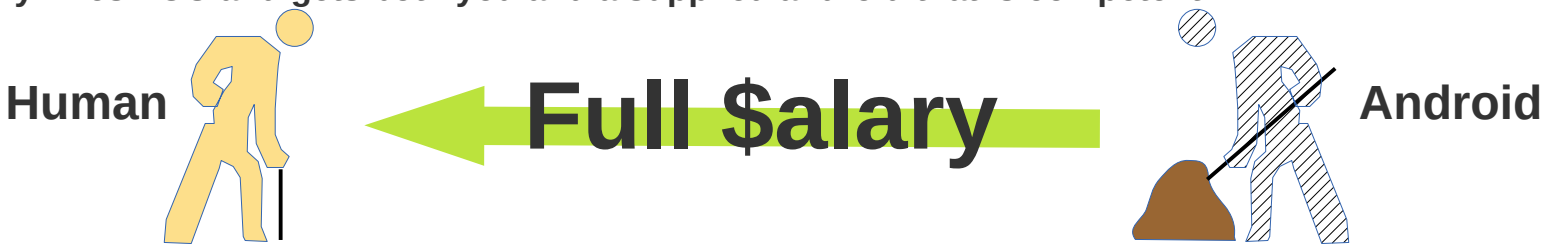
Combined, this worker pair does all the work the job position requires, thus gets a full salary. The robot has no need for the salary because it isn't sentient by a law (see the Laws of UTOPIA Androidia UA), so the human gets the full pay check. A retired human receiving a full salary is phenomenal. If a job is defined as a 40-hour work week, then 1 robot can perform 3 shifts Mon-Fri to support 3 human beings. Sat-Sun has 48 hours total. In total a single android can support 4 human beings full salaried 40hrs/week, 8 hours left over for android maintenance.

Advanced Technology

Technological advances in the 21st century android will allow androids to perform human work tasks. Whereas the Industrial Age brought machine automation to specifically tasked machinery, a general purpose android will be able to perform all human tasks. This is because the android has two legs, torso, arms, hands, fingers, head, eyes and ears, etc. Having a human form allows the robot to manipulate the world which humans have designed for that human form such as opening door knobs, pushing buttons, pulling levers, pushing pedals, swinging a hammer, scrambling an egg, etc. The 21st century gives it the mind of a human. Dynamic plugin-in knowledge packs will allow instant learning for androids.

Such an android will be able to replace humans at their jobs because an android can work 24 hours/day non-stop for no salary. If left to unregulated market forces, most companies will find a lower-cost competitive bottom line by replacing human workers with robots, but that will lead to vast unemployment which leads to conflict between unemployed humans and employed robots. If a “regulated cooperation” is done, there will be no competition between the robot and the human as per UTOPIA Androidia. In the UTOPIA Androidia model retirement is re-defined as the time when the human stops working and the persons robotic proxy works full-time, drawing a full-time salary with benefits as the Laws of UA mandate. Social Security, pensions and 401(k)/IRAs become obsolete.

1. **UTOPIA-Androidia Retirement is 1 robot working FULL-TIME in your job cooperatively FOR you.**
2. **Its full salary goes TO you as your work-proxy, and it pays better than Social Security.**
3. **NO other human being(s) needs to spend THEIR money to support YOU as in SS.**
4. **There is no need to save for retirement in 401(k)/IRAs. Instead, you spend this money as you get it.**
5. **The government can contract this model to private industry. You don't own/maintain/house the robot.**
6. **A company hires YOU and gets both you and a supplied android that is competent.**



No. 006B, 2015-09-07 Updated 2024-08-02

UTOPIA Androidia - A Solution to World Poverty and Hunger

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Causes and Effects of Poverty, with Solutions

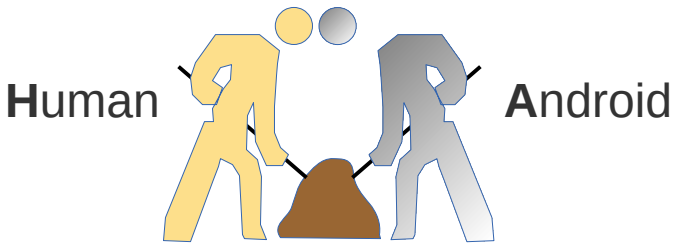
It is possible through the application of the UTOPIA Androidia (UA) labor model to put an end to poverty. Here we look at the causes of poverty historically, and then see how UA solves them. The assumption here is that the UA labor model is in effect and therefore every human has been paired with an android. There are other ways to solve poverty, but the UA way pays for itself and has the feature of obsoleting all retirement savings mechanisms like Social Security, Pensions, IRAs, 401k, etc, plus obsoletes disability worker funding models.

1. **Born into poverty** - This is no longer the case as parents are taken out of poverty by UTOPIA Androidia. Furthermore, the child's K-12 and some higher education is paid for. Medical care is not an issue as its 100% paid, so the medical conditions are not a factor for poverty. Education is much easier as the time pressure is solved, plus some financial support.

2. **Retirement** - As per UTOPIA Androidia a retired person has a robot which is getting the full salary at the best-paying level its human achieved.

3. **Illness or injury** - As per UTOPIA Androidia any human who becomes unable to perform work due to disability, illness or otherwise incapacitated has their robot now working full time to support them through recovery or until death.

Paired Labor of UTOPIA-Androidia



Your working robot pulls you out of poverty!

4. **Misfortune or chance** - Some people may lose their land to earthquake, volcano, war, etc. These people are covered by their robot that works while they deal with the misfortune. A World Peace solution is addressed at http://intractablestudiesinstitute.org/c/RoadmapForWorldPeace.pdf

5. **Technological change** - In dynamic, technologically advancing economies there can be new technologies that replace old technologies. Worker skill sets in the old tech need to adjust to become fluent in the new tech. eg; the old skill set of horse-shoeing was obsoleted by automobiles, but auto maintenance is a comparable tech replacement. In UTOPIA Androidia upskilling is easier because the robot can work full time, leaving the human enough time to re-train and re-educate themselves.

6. **Alone** - Often a persons social group can help a person escape poverty. Group-knowledge of job openings can often lead one out of poverty . This is less necessary in UTOPIA Androidia since a person always has a robot assigned to them for labor as a safety net. So if you become alone, you're robot still does the necessary work for both of you.

7. **Motivation-challenged** - Some people may simply resist work and/or education at any cost. Their robot thus performs least-skilled tasks, they get the lowest wages. If they want a higher wage or to change jobs, they must overcome the motivational challenge because time and resources are no longer constraints to higher education and better paying jobs.

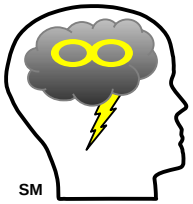
8. **Hunger** - World hunger and food stamps become unnecessary since there is 100% employment with the working android.

9. **Government aid** - Aid from the government is minimized so long as the government assures that UTOPIA Androidia is run efficiently. Entitlement programs become unneeded since people who otherwise need aid from the government now get aid from their robot that has a job always. Entitlements like Social Security are obsoleted as the robot's job pays better than SS.

10. **Homeless** - On street corners and intersections, beggars can go home because their robot is working. Or they can go to school to upskill.

11. **Illegal activities** - Some people do illegal acts as a means of getting money. Since their robot is working, the need for illegal acts is reduced.

No. 006C, 2016-03-26, revised 2024-08-02



The Two Categories of Intelligent Life Forms

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Two Categories of Intelligent Life Forms.

1. Individual.
2. Group.

Intelligent Individual Life Form Properties.

1. It has measurable intelligence.
2. It *can't* split into 2 or more measurably intelligent life forms.
3. It can *aggregate* into a group life form with measurable intelligence.

Intelligent Group Life Form Properties.

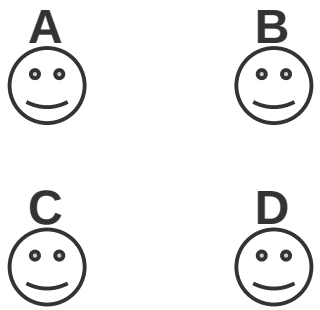
1. It has measurable intelligence.
2. It is a *composition* of 2 or more measurably intelligent life forms.
3. It *can* split into 2 or more measurably intelligent life forms.
4. For N life forms there are MAX 2^^N – 1 possible life forms.

Examples of Intelligent Group Life Forms.

1. Best friends
2. A team
3. City government
4. State government
5. Province
6. Political party
7. Corporation
8. Sports team
9. Organization
10. Nation/Country government.
11. United Nations
12. Earth/Gaia

Note: A measure of intelligence is not provided here. See the L3-IQ-Scale.

Example: Given 4 individual life forms:



There are 4 individual and 11 potential group life forms by members. There are an unlimited number of possible groups by activity because any grouping can have multiple and unlimited activities.

Possible Groups Bitmap

N=4 : 2^^4 – 1 = 15 max life forms.

ABCD		ABCD	
~~0000~~		1000	**I**
0001	**I**	1001	**G5**
0010	**I**	1010	**G6**
0011	**G1**	1011	**G7**
0100	**I**	1100	**G8**
0101	**G2**	1101	**G9**
0110	**G3**	1110	**G10**
0111	**G4**	1111	**G11**

The L3-IQ-Scale

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Meta Rules

1. The L3-IQ-Scale is universal to any life form.
2. IQ measurer and measuree are at near same speed of thought.
3. Pre-requisites come before L3-IQ-Scale tests.
4. Some life forms can start at LN where N>1 (AI).
5. L3-IQ-Scale has a time component.
6. Life forms can be Individual or Group.
7. Only objective scientists measure L3-IQ-Scale.

Pre-Requisites

1. Able to react to stimuli.
2. Able to remember stimuli.
3. Able to think.
4. Able to remember thought.
5. Able to act at liberty.
6. Not dead, comatose, nor dis-banded.

L3-IQ-Scale

L1 – Selfless, altruistic, empathy, concern for others.

L2 – Knowledge growing: proof, reality and facts, rational skepticism.

L3 – Tolerant of other cultures, lifestyles, viewpoints, race, etc.

Rule 1: The score is the number of tests passed, no skipping. If test 1 passed, score is L1. Pass tests 1 & 2, score is L2. Pass tests 2 & 3 but fail test 1, score is 0.

Rule 2: The L3-IQ-Scale tests are not exams. They are evaluated in real world life experiences ideally when subject doesn't know they are being tested.

The L3-IQ-Scale is Like Life's Hurdles to Clear.

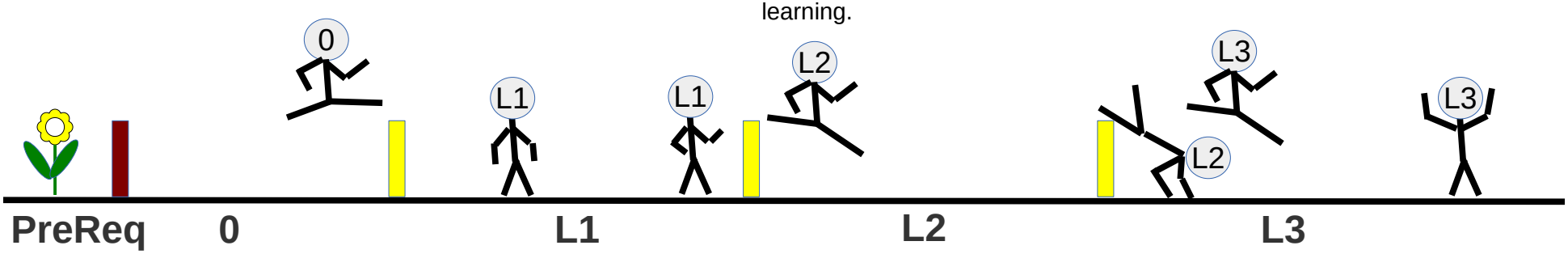
The flower can't think, it fails pre-requisites.

Selfish and greedy life forms are frequently observed at <L1.

Selflessness, cooperation, group efforts at L1. Profit is allowed at L1.

Knowledge base of the L2 is growing and error free. Is stuck at L1 if belief prevents knowledge expansion. L2 can have belief if it doesn't prevent learning.

L3 life forms are tolerant of other cultures, colors, genders, life-styles, etc, L3s are peaceful but will defend themselves.



No. 006b, 2018-05-22 revised 2024-10-23

First Contact Protocols with Alien Life Forms

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

The need for First Contact Protocols

A high-ranking NASA scientist predicts humans will find evidence of Alien life by 2025. As is evidenced among human cultures, 1st contact often leads to conflict and war. There is no reason to think that initial contact with an intelligent alien life form will automatically go smoothly nor predictably. If the intent is to avoid war with aliens, then Protocols for First-Contact are critical. Contact will likely occur ad-hoc by chance, not in a special meeting room where everyone is prepared. If you at least have these Protocols handy, when it happens you can quickly read them to come up to speed.

The core guiding principles of the 1st-Contact Protocols come from common sense and the desire to ***minimize conflict***, and these can be applied to inter-human 1st contact as well. Imagine if Columbus had these protocols when exploring the western hemisphere.

1. How should humans treat alien life forms? The answer is trivial by answering the reflexive question, "How should alien life forms treat humans?" With respect, of course. This is simply the **Golden Rule** that people are supposed to learn in early school years.

2. **Tolerance**. If alien life should to be tolerant of humans and our many cultures and ways of life, then humans should be tolerant of them and their ways. Don't impose one's culture on others.

3. **Liberty**. Placing an alien life form under arrest for no reason other than being an alien life form should be illegal. Practice liberty and don't kidnap aliens and arrest them, the treatment of humans we expect from them. Inform the alien of the need to register and to get a travel visa.

4. **Smart**. Smart is the best tool in a 1st contact situation. Be prepared to learn unexpected things things. Every culture offers new ideas to other cultures when contact is made.

5. **Altruism**. Be prepared to render assistance if the alien seems to be in trouble or in distress. One could get a free space ride for helping out. Friends help friends. Show some concern for aliens. **Altruism** is a virtue. If 1st contact didn't go so well, be patient, maybe they just had a bad day.

Careful with Assumptions

It is an error to assume that alien intelligent life will appear like us. Keep an open mind. If you don't grasp this, you my not be qualified for 1st contact.

1. **Scale** – Do not assume that extra-terrestrial life is the same size as humans, nor that it is individualistic, it could be group-based.

2. **Speed of thought** – Do not assume that extra-terrestrial life thinks at the same speed as humans. The slower one wishes the other has patience.

3. **Communication** – Do not assume that extra-terrestrial life communicates with sound in an atmosphere. They may communicate with flashes of light or wavelengths of EM we cannot see with our eyes. 1st contact could have communications time lags of decades across stars.

4. **Habitat** – Do not assume that extra-terrestrial lives in an atmosphere. Oxygen could be toxic to alien life. They could be methane-breathers, liquid swimmers, flyers, etc. Their habitable zone could be the cold outer regions of a solar system, and water could be like hot magma to them.

5. **Food** – Do not assume that extra-terrestrial life consumes bio-mass for energy replenishment. It could be solar powered. They may not have esophageal tracts. Water could be toxic to alien life. Offering water could be an act of war.

6. **Territory** – Do not assume you own the space and/or planets, asteroids, comets that you encounter around other stars and interstellar space. Find the nearest governing body in space to find the rules for acquisition in your sector.

7. **Space Junk** – Do not assume you own uninhabited spaceships that you find in space. If you crash your car and leave for help, you expect to still own it when you return. Don't get greedy.

8. **Peaceful or Warrior** – Do not assume the life you encounter in space is peaceful nor warlike. Use the L3-IQ-Scale to measure the L3 IQ of the life forms, and thus determine their peacefulness.

No. 052, 2016-02-27 Revised 2025-02-17

The Blueprint Road Map to World Peace

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

World peace is a far, distant dream of humanity. A solution is in 3 parts:

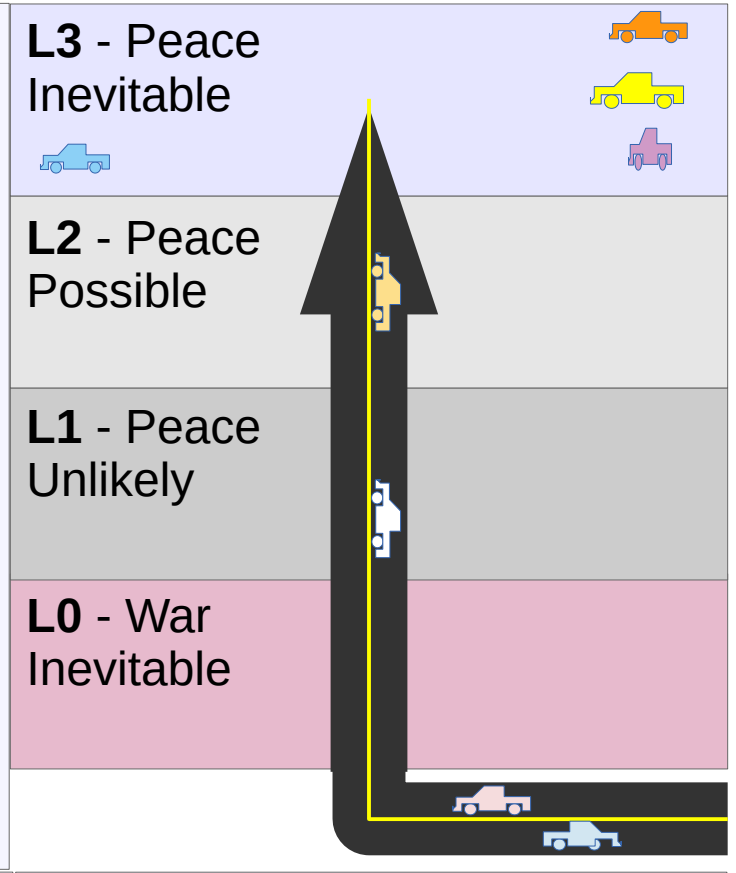
1) Two Categories of Intelligent Life Forms (bottom left).
2) The L3-IQ-Scale (bottom middle).
3) The Four Conjectures of World Peace (bottom right).

It is now easier to chart a path to World Peace. Via application of the L3-IQ-Scale the individual and group-life-forms world actors and governments can be measured for their L3-IQ-Scale score. This score will be useful to determine if the individual or group life form is helpful or a hindrance to World Peace.

1 - Existing leaders/actors of the world entities (people, govts, corporations,.) are measured to determine their score. Any score less than 3 on the L3-IQ-Scale is the reason for the prevention of World Peace as per the Four Conjectures of World Peace.

2 - Prospective world leaders/actors can be measured for their score prior to elections or succession with favor for the candidate at L3 on the L3-IQ-Scale, meaning that candidate offers a better chance for World Peace.

The United Nations (UN) Security Council (SC) can be adjusted to additionally require its members to be Level-3. When a SC member drops below L3, it exits the SC. **This means UN SC members become selfless, smart and tolerant.**



1) Two Categories of Intelligent Life Forms (brief version):

1. Individual
2. Group

For any N intelligent life forms, there are **(2^^N) – 1** potential group life forms as combinations of those N.

2) The L3 IQ Scale (brief version)**:**

L1 – Altruistic, selfless, empathy.
L2 – Rational, smart, skeptical.
L3 - Tolerant.

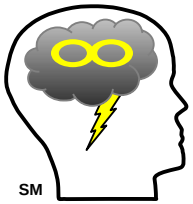
A rule is Level *N* (L*N*) can only be reached when **lower numbered N** is achieved.

3) The 4 Conjectures of World Peace:

1st – Any actor at L0; war is inevitable.
2nd – Any actor at L1; peace is unlikely.
3rd – All actors at L2; peace is possible.
4th – All actors at L3; peace is inevitable.

Actor is a world leader or with influence.

No. 024, 2013-08-27, Revised 2024-08-02



On Methods for Computational Creativity

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

VCA - Variables, Constants, and Assumptions

#!/bin/think
for each Variable, Constant, Assumption in a model ; do

1. Identify the V, C, A or give it a name.
2. Change the V, C, A across its domain and exceed limits.
3. Add or subtract V, C, A from the model.
4. Apply other useful techniques below, re-model, repeat.

done

A Generalized Model of Models

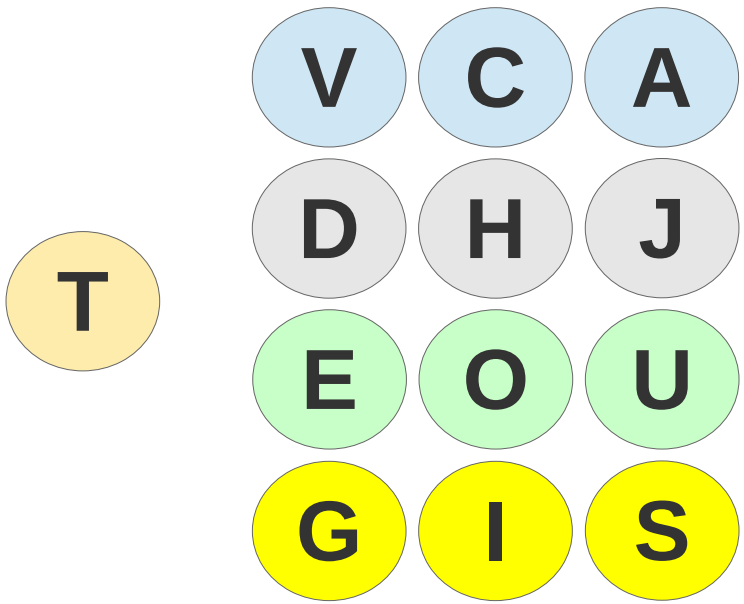
1. Models contain Things: Variables, Constants, Assumptions, Definitions, Hypothesii, conJectures, choicE, dOmain, and Utopia. Operators are Generalize, Instantiate, and Scale.
2. Definition: thing – any thing, event, process, noun, verb, … .
3. Generalize a thing one or more levels. (G). Generalizing can turn constants into variables.
4. Instantiate a thing one or more levels. (I) Instantiating can turn variables into constants.
5. Re-apply VCA at G, GI, GG, GGI, GGII, etc.
6. Domain-Analysis - Analyze the legal and illegal domains of VCA.
7. Utopian/Idealism - Decouple what from how.
8. Scale – Scale a known solution to fit the size of the problem (S).
9. State some truth, then change along boolean domain (true, false).
10. Choosing techniques:
    a) Does the choice have to be correct?
    b) Does a wrong choice exist?
    c) Is this a defining choice?
    d) Is any choice okay?
    e) Is there a set or range to choose from?

MR - Modeling Rules

Modeling Rule 1: Initial state is nothing.
Modeling Rule 2: No undeclared thing.
Modeling Rule 3: Assumptions allowed if declared.
Modeling Rule 4: Minimize assumptions, but no limit.
Modeling Rule 5: Definitions can be used if declared. (D)
Definition 1- Axiom is an assumption.
Modeling Rule 6: Hypothesis is allowed if declared. (H)
Modeling Rule 7: Conjectures allowed if declared. (J)
Modeling Rule 8: Opinions allowed but have no value.

Some models are meant to model reality, some aren't, and some are generalized to be repeatedly applied differently.

Model of Models



On a Definition of Sentience

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Sentient - definition: a multi-variate running instance/model of a life form with both awareness of and having: spatial and temporal extents, species recognizer, survival, analogy identifier/creator, a mind cast (to have an interest), language, sensory I/O, focus and Brain store. Sentience implies the right to have Civil Rights and legal protection.

The Android (artificial life form) is expected to achieve sentience soon. Rapid progress in robotics and AI in the 21st century makes this inevitable. But will the biological creators of robots have the intelligence to survive robots? Perhaps they will survive if they and their robots have L3 intelligence on the L3-IQ-Scale.

A. M1 Design of a Sentient Android's Mind

1. Spatial-Extents – Aware of its spatial extents.
2. Species-Recognition – Aware of others like self.
3. Survival – Able to preserve self existence.
4. Temporal Extents – Aware of the time concept, can plan ahead.
5. Analogy Processor – Able to grasp and generate analogies.
6. Mind Casts – Commonly observed mind patterns.
    1. Scientific – Facts, proof, skepticism, hypothesis, objectivity.
    2. Religious – Belief, spiritual.
    3. Warrior – Battle, superiority, offense, defense.
    4. Political – Authority, control, top-dog.
    5. Business – Profit, build, sell, employ workers.
    6. Artistic – Perception, subjectivity.
    7. Bios – The body.
    8. Herd – The group, clan, herd.
    9. Self – I.
    10. Partner - Significant other.
7. Language – Ability to use labels for concepts and communicate.
8. Sensory I/O – Physical interface with the/a world.
9. Focus – Self-awareness of the self-awareness of what I'm doing.
10. Brain store – A place for cognition and where memories are stored.

B. Modular design allows each of 10 to be shut off/on dynamically.
Example 1: Shutdown #3 Survival, becomes docile.
Example 2: Shutdown #4, loses comprehension of Time and planning.

No. 025, 2013-08-16, Revised 2024-08-02

How to Achieve Immortality : Project Andros

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Who? Patrick M. Rael, Director, Intractable Studies Institute.

What? A project to copy the Directors mind into an android.

When? 5 year project began Dec 17, 2011, ends Dec 17, 2016.

Where? At the Intractable Studies Institute, Peralta NM, USA.

Why? The Director's goal in life is to learn everything. But he knows his biological human body will expire before he meets that goal. Yet he is determined and likes a good challenge. Therefore, if he copies his mind into the android mind, he can become immortal because the robot is a machine and a computer: the machine can be replaced if destroyed, the computer mind can be restored from backup. In the immortal android robot the Director will have the time to meet his goal to learn everything.

How? The Institute will use its own custom in-house design for the mind.

1. Implement the M1.1 Architecture, all 10 components. The science mind-cast for #6 will be used because that is the Director's mind.
2. Encode the Think-Brain and the Perceiver-Dreamer visual system.
3. Bootstrap the mind of R. Patrick Rael (the robot), this will be BOOTDAY.
4. Encode the memories.
5. Implement the Feel-brain half of the mind.
6. Implement the Imprinter pattern where R. Patrick learns to imitate bio-Pat.

And then what? Eventually biological Patrick Rael will die from either old age, disease or accident, but he will continue on in the immortal Robot Patrick Rael to meet his goal to learn everything. Then, as the robot, he will fly into space in a spaceship of his own advanced design propelled by gravitic attraction and explore the universe, his dream since a young boy.

1. This mini-me robot is the meager start of Project Andros, a shoe-string budget project with BIG GOALS.

2. A bigger and much more advanced android robot will be needed to finish Project Andros, such as the Honda Asimo android robot. Asimo would be the IDEAL robot because it is advanced, but I want to use my own robot head. Some clothes would be nice to keep dirt and mud off this robot body. **It will be so good to move into the android robot**, leaving behind biological frailties like death, 12,199 diseases and injury, plus eliminating biological food for energy replenishment. Furthermore, traveling in space in a robot body will be several orders of magnitude easier with lower maintenance than a biological body

No. 026, 2015-11-01 Update 2024-08-02

Robust SpaceCraft Architecture (OSCAR) Mech

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

The Challenge

The exploration of space, planets and asteroids/comets is **hazardous** due to extreme environments. It is **IMPOSSIBLE** to design a spacecraft to prevent every possible condition that may occur. Thus many spacecraft, landers and rovers fail and are often effectively mission-ended. The high cost of these craft makes it desirable to have a robust architecture than can address and solve this challenge so that the craft can complete its mission. Examples of failure:

- The Martian rover Spirit got a wheel stuck in the sand, cannot move.
- The Rosetta Philae lander landed in shade, batteries drained rapidly.
- The ESA Beagle 2 Mars lander/rover never communicated back.

We can generalize this challenge to any remote dynamic craft, whether in space, on other planets, comets, asteroids, or even at remote Earth places.

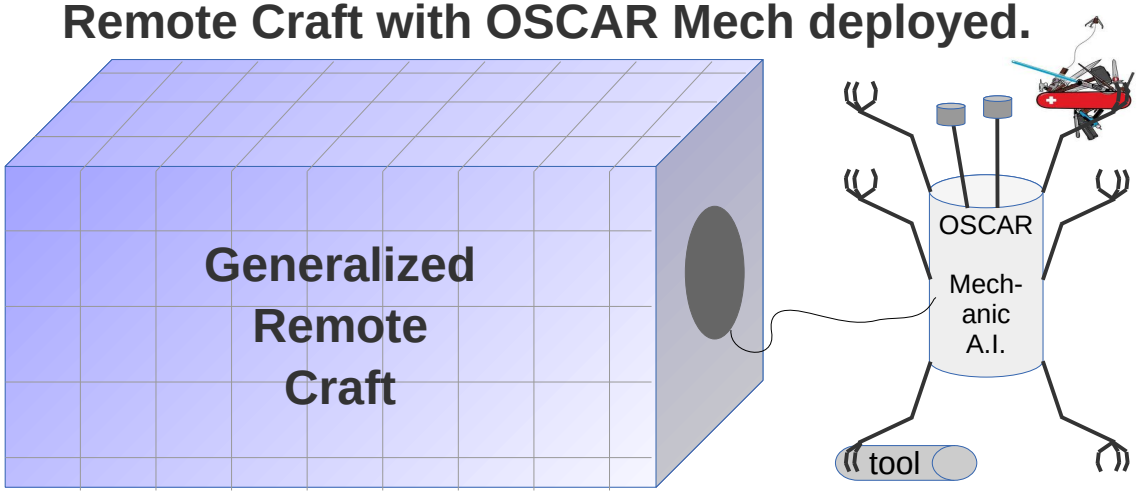
A generic Robust Spacecraft Architecture (OSCAR) is needed that includes a fail-over mechanism to deal with all of these failures **AFTER** they happen. A key observation we make is that manned craft have human beings present as astronauts, engineers, and **mechanics** to either prevent problems or deal with the resulting problem after it happened. This pattern can be re-used with a variation where the biological human is replaced with a miniature robot.

OSCAR Mech requirements

1. Remote Craft w/OSCAR include an autonomous "**Mech**" (mechanic) robot.
2. The primary purpose of the Mech is to fix the craft or the problem.
3. The Mech has free-roam inside, outside and away from the craft.
4. If necessary the Mech can break out of a damaged craft.
5. The craft can request the Mech to investigate or fix a problem.
6. When the craft fails to check-in at the regular interval, the Mech concludes a problem has occurred and initiates diagnosis mode.
7. The Mech can use the crafts communication system powered normally or bypass, and the Mech can use it's own separate communication system.
8. The Mech can use a laser/receiver to bypass the craft transmitter/antenna to communicate with external craft or earth.
9. The Mech has eyes, wheels, tracks, legs, arms, hands, and scales.
10. The Mech can deploy slow air bags to lift a craft up off the surface.
11. The Mech can deploy strong thin lightweight cables with anchors and use it's slow internal winch to pull or drag a craft out of danger or to sunlight.
12. The Mech has Artificial Intelligence to reason and figure out complex challenges.
13. The Mech is extremely light-weight, using a modular architecture to limit its weight/volume to what is necessary for each task. It can detach tools.
14. The Mech can deploy its own solar panels to power itself and the craft.

Compact mode of OSCAR has all its appendages (arms, wheels) inside its can(ister). Size is 3" diameter x 5" tall and weight .5Lb.

Remote Craft with OSCAR Mech deployed.



No. 020, 2015-11-11 Updated 2024-08-02

Titan – Advanced Space Ship and Robot Pilot

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Spaceship name, purpose, requirements

1. The Spaceship's name will be the **Titan**. Its purpose is to carry a sentient android robot (the R. Patrick Rael of Project Andros) on a mission of indefinte/infinite time span to explore the universe, both interstellar and intergalactic space. It will be a 1-way exploration. Always look forward; don't turn back! The Titan has to last between 1000 and 1 million years, the time it takes to get anywhere significant in the galaxy.

For practical purposes, the ship won't actually need to survive that long since the Robot Patrick will continue developing the technique to evolve into an incorporeal (matter-less) energy being. This will be his 2nd evolution (the 1st being his evolution to a robot). As an incorporeal being (some combination of electric field, magnetic field, charge, gravity and standing/moving rotor wave) he will have the ability to move through space and or matter.

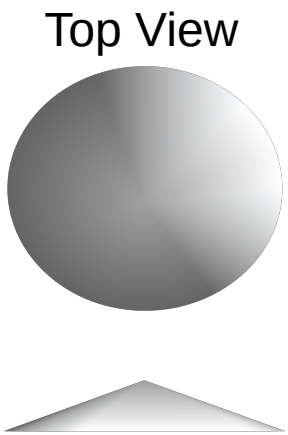
2. Robust Self-repairing - Both the internal ship parts and the exterior skin of the ship need to be self-repairing because accidents and meteoroid damage will occur on a mission this long. The OSCAR Mech architecture is the ideal candidate for this level of robustness.

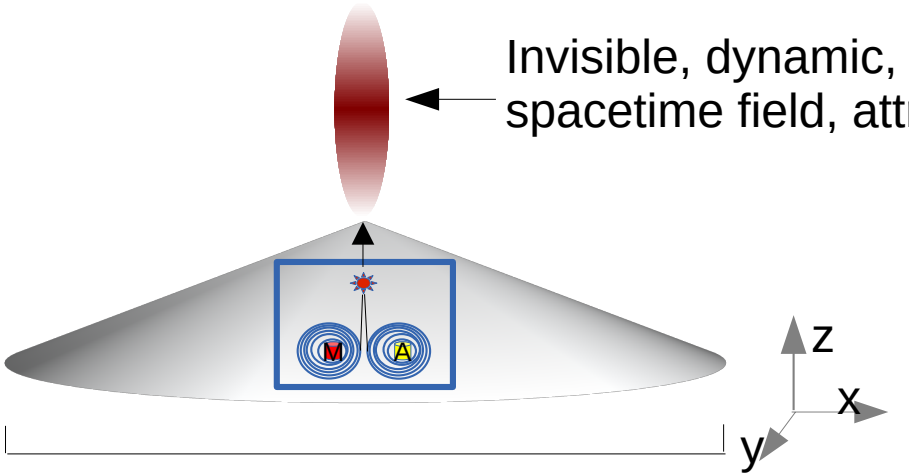
3. Motion Engine – The preferred engine is the highly theoretical gravity engine (a warped-dimension field-effect design) which is predicted to create a dynamic gravitational moment at the front of the ship from **M**atter/**A**ntimatter annihilation. The warp will attract the mass of the ship forward to it, and the warp is always regenerating further ahead (dynamic) during acceleration. Kinetic mass-projectile engines are ruled OUT as they leave a trail/trace that can be tracked. It coasts sideways to reduce footprint minimizing meteoroid impact.

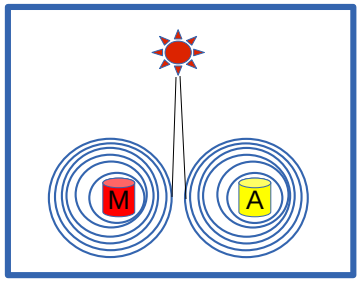
4. Shape – A gravity drive attraction engine (for mass) will require symmetry around the direction/axis (Z) of motion. When seen from the front the ship will have symmetry if rotated any angle around the Z-axis. No sharp edges will exist on the exterior surface. As meteoroid impacts in space will happen, an angled leading front surface will deflect the meteoroids best. This implies a conical shape similar to the Apollo and Orion MPCV modules, for different reasons. Perhaps the cone tip and base edges can be non-smooth.

5. Size – An android robot occupant has minimal needs for living in space. A robot does not need to “stretch its legs” nor eat biomass, nor excrete. It could disassemble it's body since the legs are mostly needed for locomotion in a gravitational field (like a planet). The AI can transfer it's mind to a smaller robot.

6. Power Supply – The power supply is primarily for powering the electronics and maintaining temperature. It should be different than the motion engine because the primary purpose of the motion engine is to move the ship. The ideal power supply is one which can recharge it's fuel in interstellar space. A personal tokamak fusion model would be ideal, and very tiny. Hydrogen as ice on comets makes re-supply easy. Prefer to not land on planet to refuel.







Gravity/warp engine

No. 020B, 2016-02-15 updated 2025-01-23

Newton – Carrier of the Advanced Titan Spaceship

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Carrier ship purpose and requirements

1. The Newton is the name of the mother ship of the Titan. Its purpose is critical: to send out a replacement Titan ship when the one out there is destroyed or becomes inoperable, inaccessible, unresponsive, or lost.

2. This is the secondary robustness system for the Titan. The Titan already has it's self-repair system OSCAR. But catastrophic damage like collision with an asteroid can destroy the Titan to the point that no amount of repair can fix it. The mother ship steps forward and releases a replacement Titan ship complete with a robot with the latest computer backup from the last sync with the Titan. In this way the Titan and it's robot pilot are immortal.

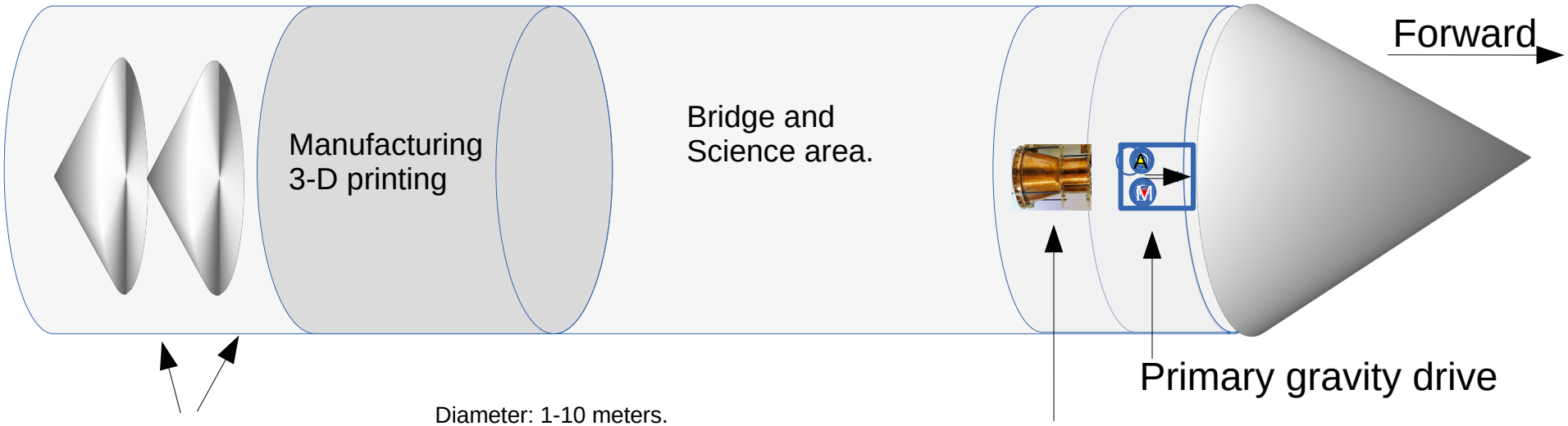
3. The Newton harvests raw materials from space.

4. Robust Self-repairing - Both the internal ship parts and the exterior skin of the mother ship need to be self-repairing because accidents and meteoroid damage will occur on a mission this long. The OSCAR Mech architecture is the ideal candidate for this level of robust-ness. Plans for constructing a Newton are aboard each Titan in case the Newton itself is destroyed.

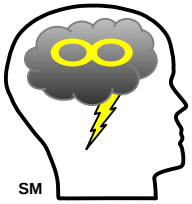
5. Size – The Carrier mother ship needs to be big enough to contain raw materials to 3-D print Titan ships, and otherwise assemble the remaining pieces that can't be printed. It must be able to keep 1 spare Titan always ready, and prints another when the ready one is released. This minimizes down-time of the Titan in the field.

6. Motion Engine – The main engine will be the gravity-drive for fast acceleration with canceled inertial effects. The secondary engine is EmDrive.

Newton – Mother-ship of the Advanced Titan Spaceship.



No. 020C, 2016-12-04 Updated 2024-08-02



Scientific Cosmological Models

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

There are two important criteria that models should be checked for (explain and predict are grouped together):

- predict testable phenomenon
- be reality

A model of reality should meet at least 1 of the above criteria to be useful. Modern science tends to value the predictive ability of a model more than the qualitative reality models. These two criteria are analyzed in a table below.

Modeling Rules:
1. Initial state is no thing, not even dimension, and zero assumptions.
2. All entities including dimensionality must be declared before used.
3. Assumptions may be used, as long as they are declared.
4. Minimize assumptions, but no less than necessary, and no limit.
5. Definitions can be used and are substitutions of word(s) for word(s).
Definition 1- Axiom is an assumption.
6. Hypothesis can be used, can be either proven or dis-proven.
7. Conjectures can be used, expectation of proof but none given.
8. Opinions can be used but have no rigorous value.
Note: #1 a blank slate is a slate thing: cannot have even that at start.

REALITY	PREDICTOR: False	PREDICTOR: True
False	There are an **INFINITE** count of these subjective models. These models are less useful to science as they lack predictive ability AND have no connection to reality. Faith is usually needed to use these models. These models are difficult to prove. The two main categories within here are deity and non-deity. This model can evolve to Predictor and/or Reality when it makes testable predictions or answers the SRQ. Examples are: I. Technical models 1. String Theory of vibrating dimensions. 2. Aether Theory - the luminiferous aether that "fills the void". II. Deity models [not scientific, usually subjective] 1. Creation myths (turtle back, genesis, eden, deity(s), egg, ...) 2. Post-death "heaven/hell" and/or reincarnation, souls, ghosts, etc.	**PREDICTOR** - There are an **INFINITE** count of predictor models. These models are very useful to science as they make predictions that are testable. Answers the question: "how much" with equations? Some predictor models can never be reality models. Often the model isdeduced from data as an equation(s) or geometry, but other times is a pure guess. Testable predictability is critical. Examples are: 1. Newtonian mechanics 2. Quantum Mechanics 3. Relativity 4. Standard Model of particle physics 5. Atomic Theory 6. etc
True	**REALITY** - There is only **ONE PHYSICAL REALITY.** To be a reality model it must answer the Standard Reality Question: ***What is natural dimension made of?*** This model is useful to grasp reality itself. It must start making predictions after time, thus it must *evolve* to become a dual Reality-Predictor model. *1. The Dium Theory of Natural Continuous Dimension --evolved-->*	**THEORY OF EVERYTHING** The reality model that can also make predictions is the best possible. Determinant: You will know the model is a TOE when questions like "What is natural dimension made of?" are directly addressed clearly upfront by the model. 1. The Dium Theory of Natural Continuous Dimension

S1 - A Solution for the Hypothesized AI Singularity

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

An AI Singularity Problem

From Wikipedia: "*The technological singularity hypothesis is that accelerating progress in technologies will cause a runaway effect wherein artificial intelligence will exceed human intellectual capacity and control, thus radically changing or even ending civilization in an event called the Singularity. Because the capabilities of such an intelligence may be impossible to comprehend, the technological singularity is an occurrence beyond which events are unpredictable or even unfathomable*."

From this definition, the Singularity is 2 things:

1. Humans may be unable to understand the AI.
2. The AI may harm or end humanity through war, accident or other.

The position of the Institute is that if AIs aren't taught "social skills" such as selfless, rational, tolerance, a bleak future will result which we call Dystopia Androidia; when AIs make war on humans. Greedy, ignorant and intolerant robots will make war and conflict for these exact same reasons that humans do. When these "uncultured" robots grow without proper social guidance, the progression to war will likely be along these lines below. Human beings are taught social skills to function properly, it should be obvious that AIs will also need to be taught social skills, or conflict will arise.

Dystopia Androidia: If robots behave like human beings:

- Humans with emotions like rage, Androids with emotions like rage.
- Humans with greed, Androids with greed.
- Humans with ignorance, Androids with ignorance.
- Humans with intolerance, Androids with intolerance.
- Humans at war, Androids at war.

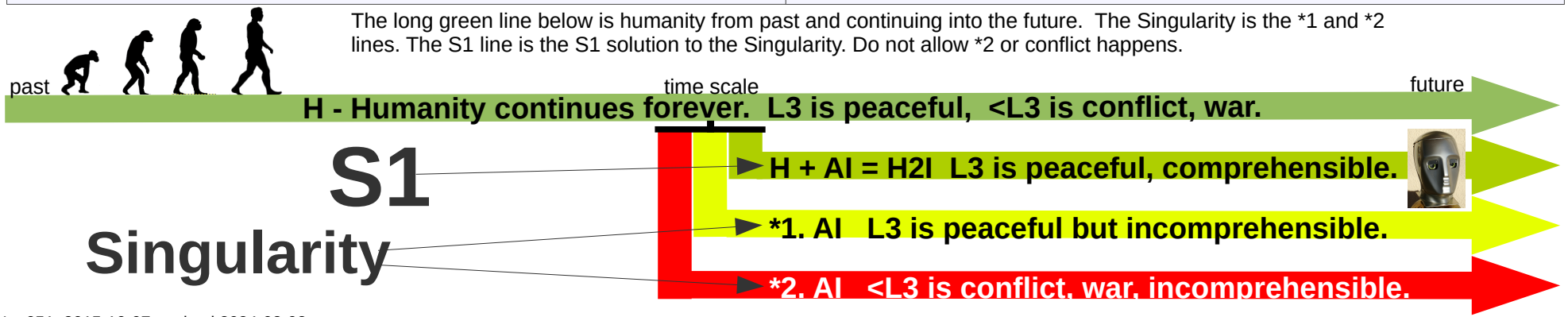
An AI Singularity Solution

The Intractable Studies Institute has an ongoing Project Andros which provides a solution to this AI Singularity challenge as a side effect. The goal of Project Andros is to copy the mind of a human being (the Director) into an android. This is an effort at abrupt evolution from a human being into an android: this is not natural selection. The intent is to effectively create a secondary instance of the Director's mind, complete with thinking, feeling, goals, attitudes, memories, sentience, etc. What will be different is the ability of this robot mind to contemplate very advanced concepts that the human mind finds difficult to think of. The Director will become a dual life form.

Regarding #1 that AI life forms may surpass human comprehension, the Institute proposes the following strategy: Do not allow the AI to remain distinct from the human intelligence (HI). This strategy can be realized if Human Intelligence abruptly evolves to be the AI, thus we comprehend ourselves. In this solution AI = HI, such as copying a human mind into a robot. It can be called the second generation architecture of human beings: H2. Its intelligence can be labeled H2I. The H2 can continue to advance its mental ability. Since it is derived from humans, it is still partially human in its mind. Participation in the H2 is voluntary. Humans who don't convert to H2I may need to rely on other H2I converts to comprehend the AI.

Regarding #2 that the AI life forms may harm or end humanity by extinction, a solution is to teach the AI and H2I the values that will prevent it from harming humanity. Selflessness and altruism, smart and non-gullible, and tolerance are the qualities which the L3-IQ-Scale measures and which AIs/H2Is can be required to attain so that they don't end humanity. AIs which are tolerant of humans, and selfless and smart will be sufficient to prevent war with humans.

The long green line below is humanity from past and continuing into the future. The Singularity is the *1 and *2 lines. The S1 line is the S1 solution to the Singularity. Do not allow *2 or conflict happens.



No. 051, 2015-10-07 revised 2024-08-02

An Experiment in Relativity: Time Dilation and Space

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

6-Twins Test for Time Rate relative to Space

Abstract: Does velocity in space cause time-lag relative only to observers as per Einstein's Relativity, or does time slow relative to space itself? A test can be done to determine definitively if there is a time rate proportional to space itself, and which merely *seems* as if it is relative to observers. It is known that a space ship at near-c velocity that stops and then resumes near-c velocity in opposite direction will have slow time, faster time, then slow time again. A scaled variation of the twin-paradox test can test this where any observed bias in direction will be evidence of rest velocity relative to space itself.

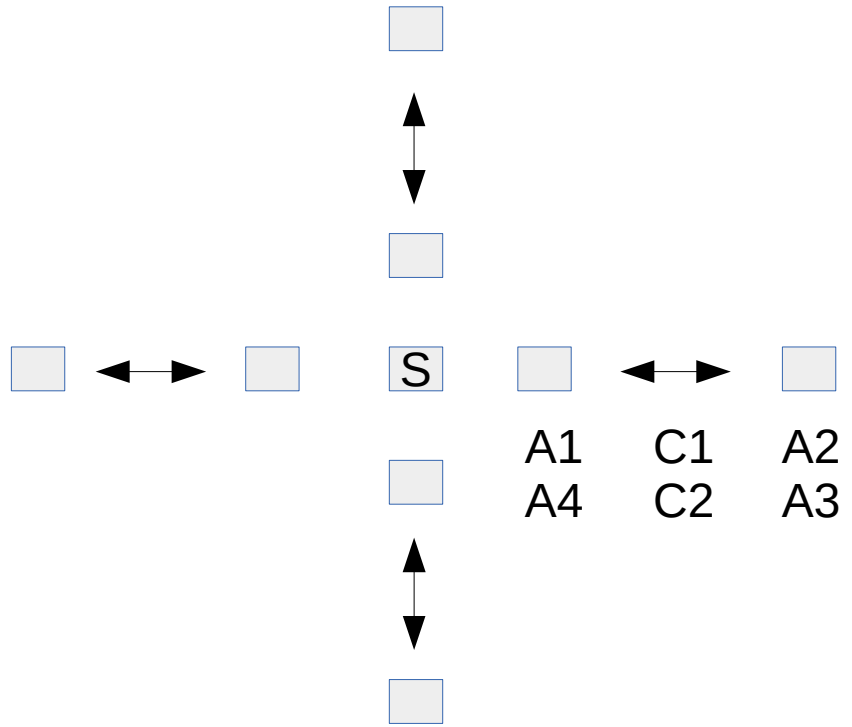
It is understood that if 1 "clock" is sent on a fast spaceship far away and then returned, that clock will have lost time compared to a "stationary" clock. This is the "Twin-Paradox" experiment. But does the direction of travel affect this experiment? An experiment can be done in 3 axii X, Y, and Z, with 2 opposite directions for each, making 6 ships clocks travel out and return. Each ship will be identical in construction, the only difference is the direction they travel. They accelerate initially A1 away from center ship S, coast C1, decelerate A2, accelerate A3, coast C2, decelerate A4 and then are back to the center ship. Minimize gravitational effects by testing far from gravity sources.

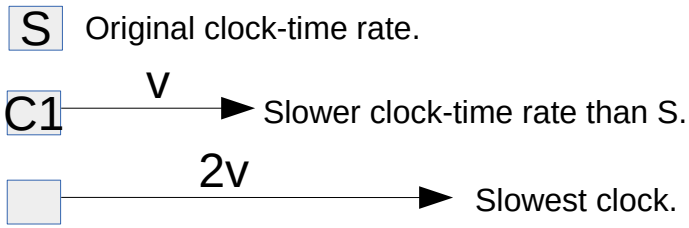
If direction doesn't matter, the clocks in all 6 ships that traveled should match each other in time lag since they all accelerated and traveled at the same speed and acceleration. Comparison to the stationary clock S is irrelevant.

If the 6 clocks return with different time lags, then direction matters. One explanation is that the clock-ships can be traveling at a velocity relative to space itself. Note that time dilation relative to space itself can still partially support the concept of pure relativity of time dilation relative to observers, this test will determine where these two diverge. If, at the start, the test must be "calibrated" to find the "rest frame", that proves the point, as the concept of the "rest frame" is relative to space itself.

Proof: Do the full test and compare the returned clocks. Time diffs can be used to find a vector to rest space. The faster of each pair of clocks points toward rest velocity.

Analytical Proof (thought experiment): If at C1 coasting right at velocity v there was another ship at 2v same direction, with a clock going slower due to higher velocity, then from the ship doing C1, it could repeat this experiment where it itself is the center, launching ships right and left. The one right that matches hypothetical 2v above must have slowest clock, the one left will match original central ship S faster clock, thus the direction will matter. This is trivially obvious. This test does not require visible observations of any other ship in motion as those observations aren't trustworthy.





No. 007C, 2017-02-10 Update 2024-08-02

On Consciousness as a Sense

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Definitions of Consciousness

Consciousness has several conflicting definitions. The definition we will solve here includes: def - ***The state of being characterized by thought, emotion, volition or introspection of something within oneself.***

Analysis

From the Communication "Experimental Sentience" we see that sensor input of red, green and blue light into the eye are 1) detected, and equally or more importantly are 2) sensed as a color. These are the 3 primary colors the human eye can sense. Additionally the human eye can sense night vision brightness, which lacks colors; it is black and white brightness. It is seemingly impossible to present externally what a person's sensation of a color like red is, except to compare to other things that match redness. Everyone, except for color-blind people, agrees the crayon labeled red is red, so people can communicate sensed colors to each other. But nobody knows if a person's sensation of redness is actually the same as another person's sensation.

For the 3 primary colors red, green and blue, that detection of the color and sensation are as described above. The color yellow does not follow this mechanism. There is no yellow color receptor in the human eye. Somewhere in the brain there is a logical function for red AND green, and when both are present at equal level, the resulting color of that pixel is called yellow. Clearly, whereas RGB colors were directly mapped from the cone receptors, the color yellow is completely invented by the brain. Just as with RGB, nobody can be sure that what one person senses as yellow is the same as what another senses, but they can agree that the crayon labeled yellow is yellow. The color white is the logical red AND green AND blue at equal and bright levels. **A sensory neuron is excited and a color is sensed in the mind**.

From this analysis of non-primary colors we can conclude that the human mind is able to manufacture the sensation of colors. If the human eye had a 4th color receptor U, then another primary color distinct from the other 3 would exist. But would white continue to be AND_EQUAL(RGB), or AND_EQUAL(RGBU)?

If the mind can manufacture colors, it seems likely it can manufacture tastes and smells and other senses, as the principle is the same: sensors detect input, that goes to the sensory neurons and there are primary senses and secondary combinations sensed.

Conclusion

This can be generalized: In the mind, a sensory neuron fires and a sensation occurs, whether color, taste, smell, etc. There is nothing that would rule out a special sensor that when fired produces the **sense of consciousness**! This is distinguished from other senses as its source is internal, not external. The logical function could be sense of:

Consciousness = OR(Thought,Emotion,Volition,Introspection)
C = OR(TEVI)

Source	Destination	Sensation
Photon → eye cone	Neuron(s)	Primary color R,G,B
Neurons R and G	Neuron(s)	Abstract color, Yellow
Neurons AND_EQ(RGB)	Neuron(s)	Abstract white
Air vibrations → ear	Neuron(s)	Sound, direction
Chemical → tongue	Neuron(s)	Taste
Vapor → nostril	Neuron(s)	Smell
Neurons OR(TEVI)	Neuron(s)	Consciousness

No. 025C, 2017-02-11, Revised 2024-08-02

A Design for a Permanent Space Station Colony

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Requirements for a Permanent Space Station Habitat

1. The visitor/settler profile will include all humans, so there cannot be any conditions such as zero-gravity that hinders any age group.

2. Some personnel will be permanently living in the habitat space station.

3. Artificial gravity is necessary to not lose bone density, as that would make bones weak.

4. Artificial gravity is necessary so the eyes don't lose their natural shape. Rotation creates Artificial Gravity Station (**AGS**).

5. Artificial gravity is necessary so that eating a meal and drink on a table are normal to the experience on Earth. Eating food/drink from tubes is a significant loss of quality of life.

6. Artificial gravity is necessary so that going to the restroom is identical to on Earth.

7. There will be plant life in the station that converts the CO2 that humans exhale into oxygen for humans to inhale.

8. Human waste will be converted to soil material so that there is a natural reuse cycle of biomass fertilizer.

10. Humans will consume the produce of the agriculture grown in the habitat to be self-sufficient.

11. Robots can be utilized to perform some of the hazardous work in space, and also can implement a utopian labor model.

12. The colony is a microcosm of Earth life, with police force, health services, court, restaurants, utilities, constitutional democratic republic, all on a micro-scale.

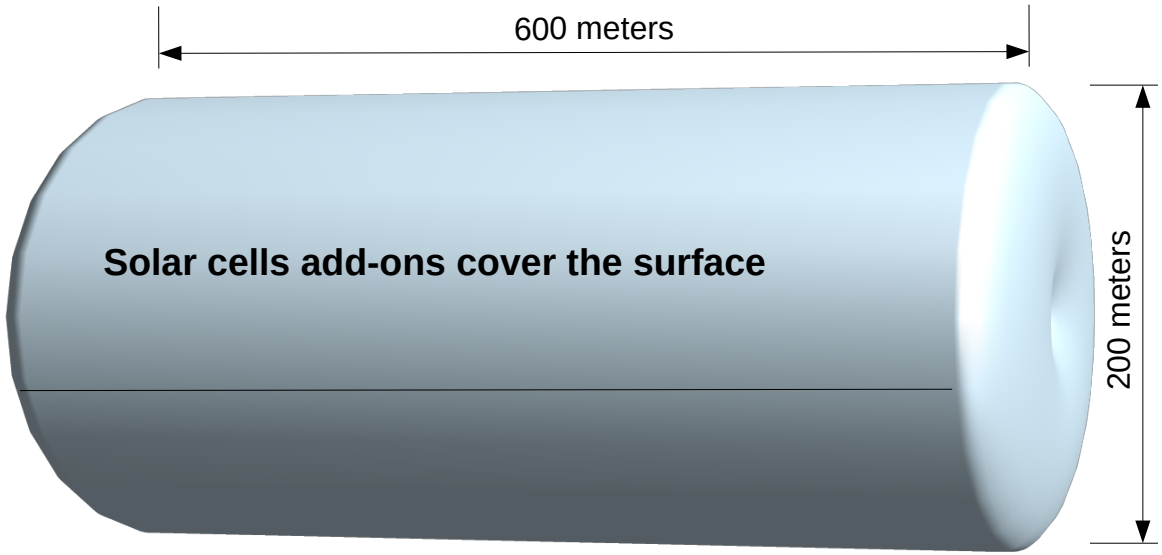
Design:

Material construction is a graphene-layers / kevlar / carbon-fiber fabric "AIR BAG". Interior is a big air volume. Pressurization to 1 Earth atmosphere in outer space causes rigidness. It is very low mass. One cord runs end to end along rotational axis to keep ends together. Non-rotating airlocks hubs are on both ends for docking craft. Rotation provides the gravity effect. Triple layer of outer solar cell backed by water bag provide 1st/2nd layer of shield against meteoroids and cosmic rays. Bag itself is 3rd layer defense and pressure sealed.

Achieving 1-gravity artificially:

At radius 50 meters (d=2r), 4.2 rotations/minute (14.2 secs/rotation).
At radius 100m (d=200), 3 rotations/minute (every 20 sec)

Ultra-low-mass Space Cylinder



No. 020D, 2017-05-04 Updated 2024-08-02

Space is an Object in Nature

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Supporting Evidence for Space as a Natural Object.

Definition: Space = The 3-Dimensional volume with time progression that is a property of, and even the definition of, our natural universe.

Definition: natural object = something that exists in reality, not an abstraction.

1. In the Big-Bang Theory, space initially was very tiny, then expanded. If it is not a thing, how can it expand? Only a “thing” can expand.

2. Albert Einstein said space can warp as the gravitational field of bodies with mass. If space can warp as gravity, then it must be a thing to have that property. If space was no-thing it can’t have properties because properties belong only to things or processes.

3. Gravitational Waves are ripples in space. If space can support a ripple as a gravitational wave, then it must be a thing to have that property. If space was not a thing, it can’t have properties because properties belong only to things or processes. It is illogical to say both that space is not a thing, but that space has properties.

4. The String Theory, even though it is theoretical and unproven, models strings as vibrating 1-dimensional objects. If it’s a vibrating dimension, it must be a thing. Physicists have difficulty accepting a 3-D volume object can exist when the evidence is all around us, but string theorists accept vibrating 1-D strings exists when there is little evidence of them. The stronger case of existence is for 3-D space object.

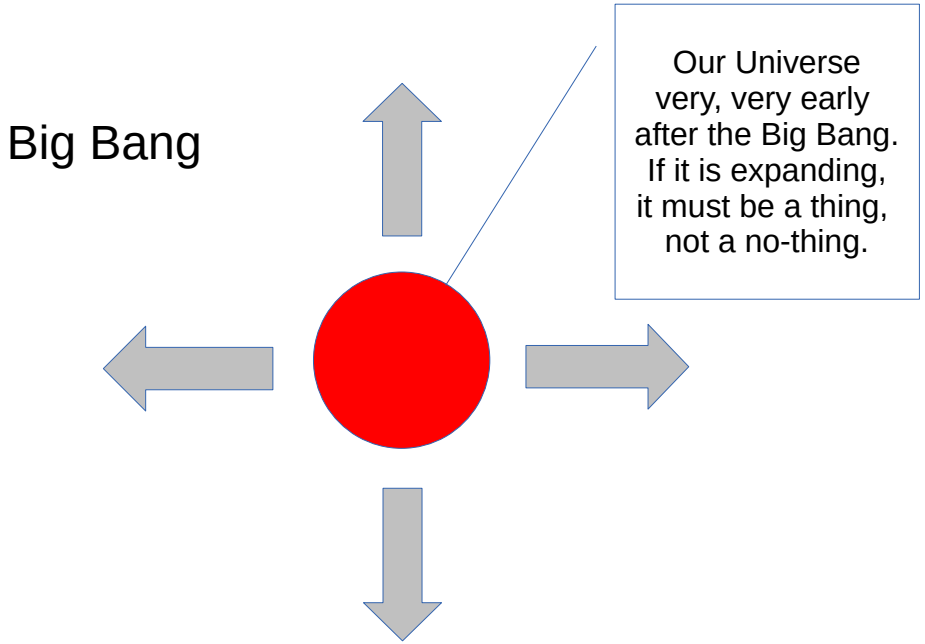
5. The Cosmic Microwave Background Radiation data shows a red-shift in one direction and a blue-shift in another direction. This is evidence of a standard cosmic rest frame, even if locally moving as per expansion or contraction. Such a rest frame is also naturally the cosmic natural dimension rest frame. See the Communication “An Experiment in Relativity: Time Dilation and Space” to find the cosmic rest frame at your locale.

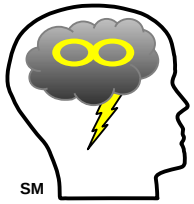
6. Fields – If space itself is the fields of gravity, electromagnetic, and charge, then it's a thing to have these properties. But even if space is space and fields are independent in the space, then space contains the fields and thus space is the container. A container is a thing that exists, not a no-thing.

The kind of thing that space is:

1. Property of volumetric extension.
2. Property of temporal progression.
3. Property of container of particles.
4. Property of container of fields.
5. Property of gravitational wave propagation.
6. Property of warp as gravity around mass.
7. Property of supporting matter-antimatter creation and annihilation.

What space isn't:
1. Space cannot be nothing.
2. Space obviously cannot be a particle.





On The Continuous Nature of Consciousness

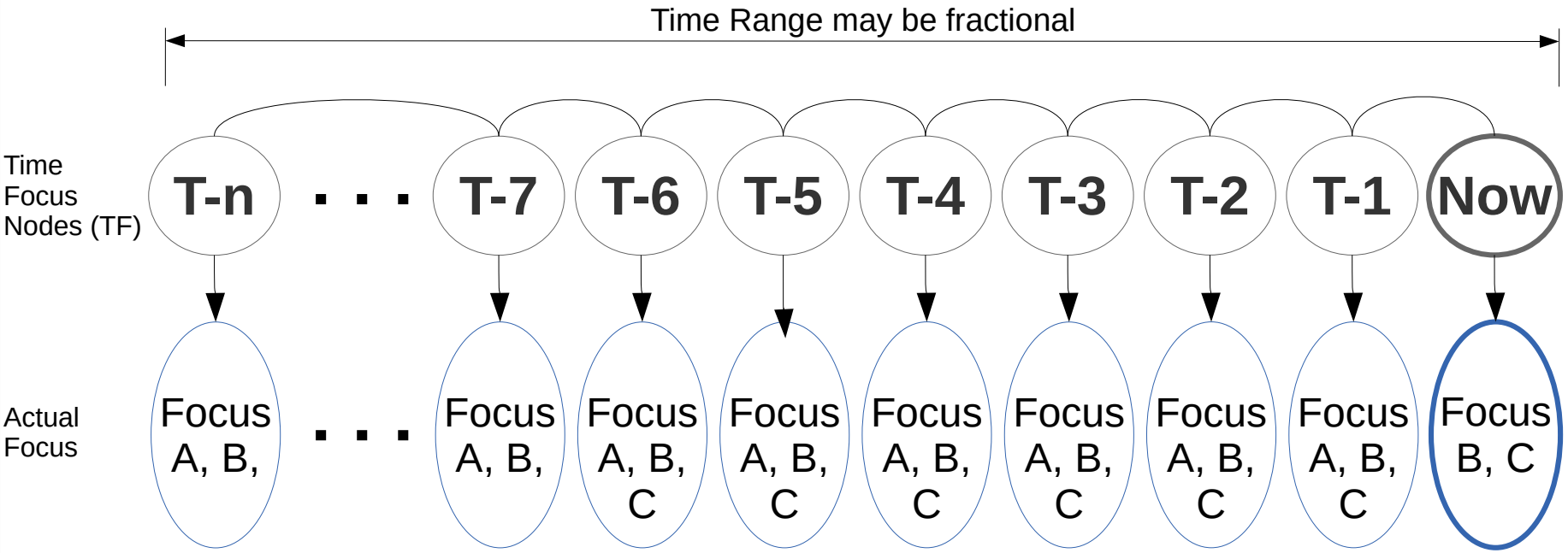
A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

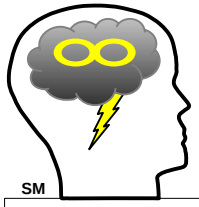
Consciousness :

1. **Is the state of being characterized by thought, emotion, volition, and introspection (TEVI).**
2. **Shuts off when one goes to sleep or is otherwise unconscious and unresponsive.**
3. **Is more than Medical consciousness which tests only for alertness which many creatures exhibit.**
4. **Is distinct from Sentience : Sentience = Consciousness + Higher Thinking. Sentience implies civil rights.**
5. **High precision time slices shows human expressed consciousness has limited time precision.**
6. **Time is #4 in the M1-Design of a Sentient Robot's Mind.**

Design of the Continuous Consciousness Model for AGI



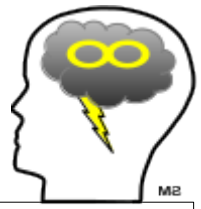
Re-triggering the aging focus over a limited time to simulate continuous or extended focus over time. Variables are the number n of TF nodes and how much time t each of them represents. The Time Range is shorter than Short-Term memory. The number n and the time t may be dynamic. This solves how to keep an idea in consciousness. When a new idea is introduced the old idea(s) aren't instantly lost, they retain for a little while longer in this model. Longer time ranges are not addressed in this model but are similar..



On Applying the Dium TOE

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org



Many complex things in Physics become simpler in the Dium TOE.

1. The hardest question "What is natural dimension made of?" is answered: **continuous natural dimension** object. It is a natural dimension object which is in fact the universe. See http://intractablestudiesinstitute.org/c/TheoryOfEverything.pdf and http://intractablestudiesinstitute.org/c/SpaceIsANaturalObject.pdf.
2. "**Nothing**" is distinguished between Strong and Weak Nothing. Weak Nothing is what most people mean when they say "nothing", such as nothing in the box which is yet full of air, or nothing in the box in space except 1 trillion neutrino particles passing thru it. Weak Nothing = dium empty of particles. Strong Nothing = Not Even Dimension (NED) itself.
3. **Dark Energy**'s energy component is simply natural dimension itself (dium) with Axiom 3 that defines dium AS energy, not merely HAS energy. The mechanism of accelerating expansion of space could be merely a perceptual effect of time slowing down as space expands/thins out. Spatial thinning may be analogous to time slowing, as time slows in higher gravity.
4. **Dark Matter** or "excess gravity" is the remnant static dimple wave (Def19) left over when its particle is separated from it. Alternatively it could be gravity as space thins out from expanding universe.
5. **Neutrino Oscillations** are the dium dynamic dimple wave Def18 (oscillating compression/decompression of space itself). Standard particles with charge aren't mass-dynamic, they become static with constant mass, but dynamic compression cycle is dynamic mass. Charge may prohibit dynamic mass oscillations.
6. The **3 Generations** of Matter in the Standard Model are likely a **3-wave train in time**, somewhat analogous to a tsunami wave train, but may be longitudinal, perpendicular, torsional, or 2 or all 3 simultaneously. It may be that fewer and more generations were/are possible in the past/future.
7. **Gravity** is a density variation in the dium usually centered on a particle. Together they are called a particle with mass. The mass is expressed entirely in the warp, not the particle. The **Higgs field** permeating all space is merely dium with energy from Axiom 3 (A3).
8. **Charge** is a static twist in natural dimension. The shape is TBD.
9. **Mass** is a measure of the amount of warp/decompression of dium.
10. Particle **Spin** may be an actual rotation about the time axis.
11. **Inertia** is the resistance to instantaneous motion change of a particle when struck by another particle because the extended warp of dium would have to instantly displace. But warps attract warps. It takes time for the particle to shift its warp, the greater the warp the more time it takes to displace that larger warp volume. However, when warps attract warps the particle is displaced without inertial effect because the entire warp is displaced simultaneously.
12. **Relativity** is supported within the Dium TOE, except that there is defined a rest velocity against space itself. An Experiment in Relativity shows how to find rest velocity against space.
13. **Quantum Mechanics** is a **Predictor Class** model of discrete things, not of continuous natural dimension. QM can predict what will happen, but not what reality is, nor should it be required to.
14. **String Theory** assumes multiple 1-D string loops which vibrate, but the 3-D dium can vibrate too. The Dium TOE's rich set of properties may be able to subsume ST vibrations without 1-D Strings.
15. **Multi-Verse** cannot be refuted with the Dium TOE.
16. **Simulation Universe** is reduced to its base with **Def13**.
17. The energy for **Many-Worlds** becomes trivial (A3), but a larger problem is revealed in **Combinations C** of all the probable states, possibly the largest and fastest growing number ever anywhere.
18. The problem of matter and anti-matter pairs of particles **appearing from nothing** is solved as these do not emerge from Strong Nothing (NED), but emerge from Weak Nothing which is dium itself. Ditto in reverse, **annihilation** returns back to the dium. Matter-antimatter particle annihilation may create a temporary warp of dium. When directed in front of a spaceship, that will attract the ship forward, see http://intractablestudiesinstitute.org/c/AdvancedSpaceshipDesign.pdf .
19. The **Strong and Weak forces** of the **SM** might be derivable.
20. The **Two-Slit** experiment might be explainable when factoring in the dium to that experiment.
21. **Entanglement**: Cut 1cm wire in 2. Measure 1. Now know other size.

No. 007D, 2021-03-12 Updated 2024-08-02

Three UAP Videos Explained with Dium TOE

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

GoFast Navy video.

FLIR1 Navy video.

Gimbal Navy rotate video.

Science has difficulty researching UAP because it is not a natural phenomenon. It is socially reclusive likely due to rules of contact with primitive species. Most scientists avoid UAP research. The Intractable Studies Institute is ideally suited to solve this as it is outside the box, free-thinking.

Explanation of UAP GoFast, FLIR1 & Gimbal using Gravity Drive.

1. The 3 UAP show no rocketry exhaust (NASA refutes GoFast).
2. The hypothesized Gravity Drive (GD) is entirely inside the craft.
3. The GD does not exhaust matter outside to propel forward.
4. The GD annihilates matter & antimatter in a stream pointed forward.
5. Annihilation creates a warp in space moving forward through hull.
6. Space warp reaches maximum in front and attracts ship mass to it.
7. A new dynamic warp is always being generated for acceleration.
8. Atmosphere & water medium neutralized, attraction still works.
9. The warp is not visible as it is gravity. Earth gravity is also invisible.
10. Gravity attracts mass, occupants too; inertia is neutralized in FLIR1.
11. The heat is periodically conducted off ship into Ocean/Sea/Lake.
12. Heat store can be ejected if spare is present (Offutt, Big Lake Park).
13. FLIR at right shows Gimbal craft is BLK hot, needs cooling.
14. Annihilation creates molten metal heat, stored in internal heat sinks. With spare, molten hot tank can be dumped, surprising the hominids: http://intractablestudiesinstitute.org/communications -> DesignOfTheGravityDriveEngine.pdf AdvancedSpaceShipDesign.pdf TheoryOfEverything.pdf https://www.savannahnow.com/story/lifestyle/2011/02/09/offutt-mass-molten-metal-leaves/45409349007/

Theoretical

Experimental Sentience for Androids

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Abstract: The challenge of programming consciousness suffers from multiple competing definitions of Conscious. Humans and animals can be conscious and unconscious. A better word is "Sentience" which humans have that separates humans from most cognitively-challenged animals. A design of an experimental solution for sentience is provided. -Director

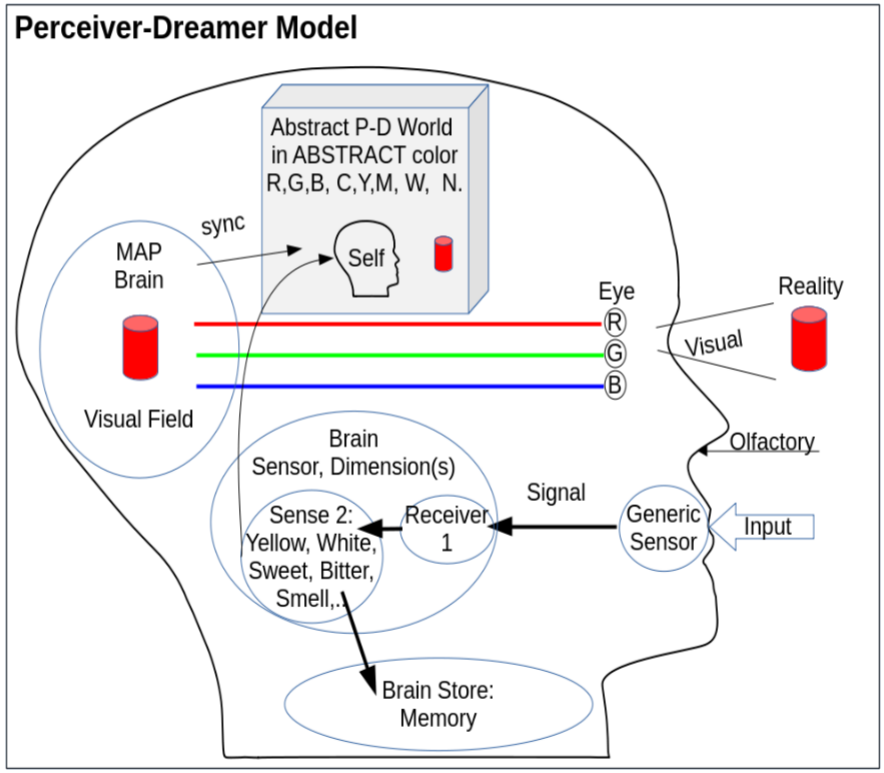
I. M1-Design

A sentient life form has all these 10 properties; none can be missing. The intent is not to merely implement these minimally; they must be implemented correctly. The modular design allows each of 10 components to be enabled and disabled independently.

1. Spatial-Extents – The life form is able to be self- aware of its spatial extents, meaning it is consciously aware of its own body and its body's extents, where its body ends and the surroundings begin. The awareness is also of its 3-D surroundings. The Perceiver-Dreamer 3D model has perception in the 3D model. Decoupling P-D from senses enables dreaming during sleep.

2. Species-Recognition – The life form is aware of others like self. This creates a social context of other sentient life forms. This will be useful to fit into the social structure of the sentient human society.

3. Survival – The life form is able to preserve its existence. There is a **fear** (emotion) of starvation, dismemberment and damage. Starvation for an electrically powered robot is loss of electricity and/or batteries drained. Excess emergency batteries are AKA fat. There can be exceptions in rare cases of sacrifice for the common good or a noble cause.



4. Temporal Extents – The life form is aware of the time concept, and can plan ahead. It knows that events happen in space AND time. It makes plans for its future. It has an awareness of any limits to its lifespan, or if it is immortal.

5. Analogy Processor – The life form is able to grasp and generate analogies. This is the ability to learn a new thing by comparing it to a thing already known. Some jokes and puns can be understood with analogies.

6. Mind Casts – The life form has a mind-cast which establishes an area of interest, such as science, religious, warrior, political, business, art, bios, herd, self and partner. There can be major and minor MCs and multiples. At least one or more major, and zero or more minor. The life form can choose its mind-cast based on what it **wants** in life, and/or wants at this time. The mind-cast can change as the life form develops.

7. Language – Ability to use labels for concepts and communicate. A word or glyph is the label, it has an underlying meaning. See the #7 Language example of word encoding.

Implementation A: The directory tree design where each word's letter is a directory allows for compact, repeated use of words that start with the same spelling. Unix filesystem symbolic links can encode information about the word and connect to other parts of this knowledge base. Information can be encoded in the name of the link and where it links to. End-of-word can be an underscore symlink to 'ZZ'. XFS can optimize disk and RAM-disk. SSD improves seek time.

```
[bash ~]$ ls  /b/e/e  /b/e/e/f
/b/e/e/_ -> ZZ
/b/e/e/NounSense1 -> flying insect
/b/e/e/NounSense2 -> social gathering
/b/e/e/f/_ -> ZZ
/b/e/e/f/NounSense1 -> meat
/b/e/e/f/VerbSense1 -> complain
```

Links pointed-to can be looked up as in /m/e/a/t/_ and /i/n/s/e/c/t/_.

8. Sensory I/O – The life form has a physical interface with the world. Sensors include eyes/cameras (visual), ears/microphones (auditory), smell (olfactory chemical vapor), skin (touch, temperature, pressure), taste (chemical sampler), balance/gyroscope (xyz rotation and up-vector).

No. 025B 2016-10-16 updated 2024-08-29

9. Focus – Self-awareness of the self-awareness of what I'm doing and thinking. There may be many ideas competing to become prevalent, but the Focus narrows that to 1 idea. This component is where the “want to do” is satisfied. Whereas #3 Temporal Extents gives one the ability to plan ahead, and #6 Mind Casts provides an area of interest, this Focus is what allows it to happen. A lack of focus will prevent one from reaching a goal. This component includes **consciousness**.

10. Brain store – The place where memories are stored. This is the structure of the mind of the robot. It has some requirements: Extreme robustness and crash-proof. Ideally it should not require a special purpose process to be executing for it. Non-blocking operations are needed.

II. Think-brain and Feel-brain

The Think-brain is where thoughts enter the consciousness and can be traced in time as the stream or history of thoughts. The Feel-brain is everything else in the brain and connected tissue, including muscle motor control, the autonomic nervous system, emotions, feelings subconscious, and sensation. Some of these can represent in both the feel- and think-brains, like the sense of red and information about red.

III.Sensation

To a life-form who has never experienced the sense of sight, or audio, or smell, or taste or touch, no amount of knowledge about such senses, however technical, can provide the experience of what it is actually like to experience that sensation. This is a clue that the sensory input qualitative experiences, such as seeing red, green, blue, cyan, magenta, yellow and white, do not belong in the "Think-Brain", but rather exist in the "Feel-Brain". One cannot explain by words the sensation of seeing yellow to another life form who has never seen yellow.

There is a fine point that needs to be clarified. A human H1 can detect red apple color. H2 can also detect the red color. Both agree that the apple is red. But there is no way to confirm that the H1 and H2 mind's perception of red is the same. The only confirmation is that they agree that what they see is what they have been taught to use the label "red" for. Stated differently, what if a person has a 4th type for color cone in their eye for ultra-violet. What color would that be sensed as? No doubt the label would be "ultra-violet", but what color in the mind would that be represented as?

If it can't be proven that two people sense the same color in their mind for red, how can a robot AI be expected to also compare its sensation of red to humans, and even to other robots? No doubt the detection of red can be agreed upon, but what about the sensation?

Note that human eyes have cones for red, green and blue light wavelengths, and we thus sense RGB. But yellow is the adjacency of red and green. Yellow is entirely made up in the mind from red and green and no blue. Ditto cyan and magenta. White is when adjacent red, green and blue cones are active simultaneously, and is also an entirely artificial color sensation. The mind has the ability to not only sense physical color wavelengths, but to perceive artificial colors for mixed colors.

A Generalization: All the senses of vision, smell, taste, audio and touch have the same sensation feature, distinct within the sense, except for synesthetics who's senses overlap. So a solution to perception of the sense of one should be the key to solving them all. Clearly this is outside of reasoning the sensation, it is in the Feel-Brain.

Dimensions may be used to model sensations and emotions/feelings. Just as two colors can combine for yellow, two emotions/feelings, joy and trust, can combine for love.

IV. Stages of life

Set expectations for the Robot AI based on robot age: infant, child, adult, etc.

Infant robot - A robot AI at this stage will starve to death/shutdown since it does not have the capacity of #3 Survival.

Pre-adult robot – A pre-adult robot may be able to solve energy-replenishment to avoid starvation, but it has neither the cognitive ability nor experience to subsist on its own independently. As a pre-adult this robot is not legally allowed to decide on its own if it is ready to becoming an Adult Robot. The pre-adult robot needs a kind of “sandbox” to “play/learn” in, much like human pre-adults (aka adolescent) have special rules designed for them to learn life's lessons without severe consequences for their mistakes. Mistakes are expected to be made by pre-adult robots as part of their life's lessons.

Adult Robot – An adult robot is one which has BOTH the cognitive ability and experience to subsist on its own independently.

Immortal - An immortal robot is one that demonstrates an ability to survive complete destruction, such as through backup/restore of its computer mind into a replacement robot.

NOTE: The energy replenishment needs of an electrically powered android robot are different than those of a biological human. The human requires biomass through ingestion. The robot is simpler, requiring only electricity which can be satisfied with solar panels. A robot can go into the barren sun-lit desert with solar panels and subsist on sunlight. A human would die of starvation there.

V. Conscious vs Sentient

Consciousness is a dynamic set of actions and/or thoughts over time, not a snapshot of variables in a state diagram. Given a snapshot of a computer program, it's impossible to deduce consciousness from that snapshot because by definition it has no change of time. Humans and animals can be found unconscious, as in sleep, or made unconscious as before surgery. When awake, humans are sentient and conscious, animals are only conscious.

Humans and animals both have emotions, this is trivially true. Animals display fear, anger, happiness, etc. Emotions are not the determinant of sentience nor consciousness.

Dium TOE: What Natural Dimension is Made Of

A Communication of the Intractable Studies Institute
Patrick M. Rael, Director, IntractableStudiesInstitute.org

Abstract: The Institutes position on the universe is that dimension itself has to be re-solved before particles and forces. Such a solution is provided here.
-Director

1. Modeling Rules

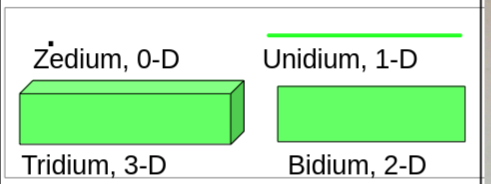
1. Initial state is no thing, no dimension, and zero assumptions.
2. All entities including dimensionality must be declared before used.
3. Assumptions must be declared.
4. Minimize assumptions, but no less than necessary, and no limit.
5. Definitions are word(s) substitutions.
6. Hypothesii can be either proven or dis-proven.
7. Theorems are provable within the model.
8. Conjectures have expectation of proof.
9. Opinions have no rigorous value.

2. The Dium Hypothesis of Natural Dimension

Definition 1: Axiom is an assumption.
Definition 2: Natural dimension is the dimension that is our reality, as opposed to artificial and/or abstract dimensions such as the Cartesian plane for the relation of arbitrary variables in equations.
Definition 3: Continuous – A region which is made entirely of one thing, not a collection of many discrete atomized things. The continuity is infinitely small, therefore not constrained by the principle of atomicity.

Axiom 1: Natural dimension exists as a continuous object.

Definition 4: dium is continuous natural dimension of any cardinality.
Definition 5: zedium is a 0-dimensional continuous point dium.
Definition 6: unidium is a 1-dimensional continuous linear dium.
Definition 7: bidium is a 2-dimensional continuous surface dium.
Definition 8: tridium is a 3-dimensional continuous volumetric dium.
Definition 9: quadium is a 4-dimensional continuous 4-D dium.
Definition 10: chronodium - the solid form of time, aka history.
Definition 11: chronolium - the dynamic form of time, aka future.
Definition 12: dium density - the amount of dium per region.



Definition 13: Universe is the union of all natural dimensions.

Axiom 2: Natural dimension can neither be created nor destroyed: it can only be transformed.

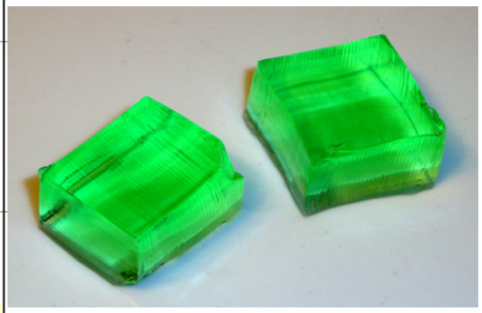
Axiom 3: Natural dimension is fundamental energy by existence, not by relation.

Axiom 4: Natural dimension is capable of phase property, and 3 phases: continuous, particulate and constant.

Definition 14 : Visco-elasticity of dium - A property of any dium where a subset of the dimensions region can deform in an elastic, flowing, and twist without necessarily causing the coordinate system within the dimension to also deform. The resistance to deformation is not caused by particle collisions as in matter fluids, because dium is a continuous object.

Sub Axiom 4.1. Continuous phase dium has three properties:
4.1.1. Elastic property gives rise to gravity.
4.1.2. Flowing loop property gives rise to magnetism.
4.1.3. Twist property gives rise to charge.
Sub Axiom 4.2. Particulate phase is a particle.
Sub Axiom 4.3. Constant phase is static dium, aka history.

Sub Axiom 4.4: Natural dimension in the elastic phase supports rotor and dimple waves.

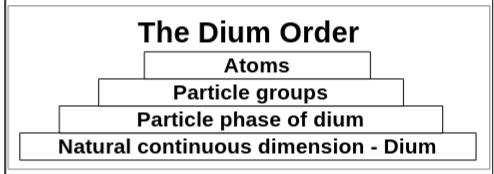


Gelatin cubes are an imperfect analogy to dium.

Definition 15: A rotor wave is a local twisting (torsion) oscillation of dium which then rebounds back in the opposite direction, then back, repeating endlessly without dissipation. A rotor wave can travel in a direction perpendicular to its axis of rotation. It is the dimension itself which is twisting.
Definition 16: An electromagnetic wave is a rotor wave.
Definition 17: A static rotor wave is a rotor wave which stops oscillating at a moment in the oscillation cycle. The region of space is left with a twist. This twist is called charge. The amount of twist is the amount of charge.
Definition 18: A dimple wave is an oscillating rebounding inward/outward compression of dium to higher/lower than surrounding density which then rebounds back, repeating endlessly without dissipation.
Definition 19: A static dimple wave is a dimple wave which stops oscillating at some moment in the oscillation cycle. If the oscillation stops at maximum compression then dium density is higher at the center and at a lesser density surrounding. The delta in density is called a warp in space-time, aka gravity. The higher compressed inner region is called "a particle".

Sub Axiom 4.5: All waves in dium are propagated solely as a property of the continuous dimension, not as particle collisions.

Definition 20: Nothing - no dimension nor time. Empty space is dium, not nothing.
Definition 21: Solidity - A region where particle or solid dium cannot be co-occupied.



Theorem 1: Natural dimension continues to exist when observers stop measuring it. [Certainty principle]

Proof: (Indirect method) If natural dimension ceased to exist, that would violate the conservation of natural dimension axiom.

Opinion 1: The preceding is intended to describe our known universe, as opposed to being only a theoretical model.

Hypothesis: Our 3-dimensional-spatial and temporal universe is composed of dium conforming to the axioms above.

3. The Mechanisms of 3 Fields

Gravitic attraction, **magnetic** attraction and repulsion, and **charge** attraction and repulsion, all have the common property of symmetry-seeking, thus reducing three unknowns to one unknown of symmetry seeking.

No. 007, 2014-02-16, Revised 2025-01-07

Hypothesis: A particle with a dimple field is defined earlier has having mass. It is the distortion of the dium in its dimple wave that expresses the gravitational strength. Two+ particles have dimple fields that intersect, it is the fields themselves that attract each other, not the particles. The fields seek to achieve fully symmetric overlay centered on the dimple origin. This solves "action at a distance".

Hypothesis: The mechanism of magnetic attraction and repulsion: Magnetism is defined earlier as a loop flow of dium. When there are two magnetic fields near each other the loop flow vector field cannot flow through another loop flow magnetic field. Repulsion will occur when the vectors are opposing. The two magnetic fields attempt to achieve a fully symmetric overlay centered along the central axis of the flow. Opposite magnetic fields attract because this aligns the central axis of the flow. This solves "action at a distance".

Hypothesis: The mechanism of electric charge attraction and repulsion: The electric field was defined earlier as a static twist of the dium. The twist distortion of the dium can be visualized as a vector field. The twist is an in-equilibrium. Two equal but opposite charged/twist electric fields can create a symmetry only by canceling the twist by superimposing both twisted dium fields. The fields seek this symmetry state by opposites attracting. Same twist/charge fields repel because that decreases the symmetry. The exact shape of the twist is not provided here.

The three dium field properties above combined with dynamic and static temporal are a rich set of properties of the universe. These properties and/or combinations of these likely account for the Weak and Strong forces.

4. The Geometry of Dium

Theorem 2: The union of two or more diums of max cardinality N results in the same N ie; two lines are not a plane. Proof trivial.

Theorem 3: The intersection of two or more diums of max cardinality N results in the same max cardinality N. ie; ditto

5. The Nature of Time

Two competing models of time are presented with very different characteristics.

Axiom 5: Temporal change implies a delta in time from T0 to T1. If no time is present, there cannot be change.

Theorem 4: A static universe will always remain static.

Proof: Given a static universe which is the union of ALL dium, ANY introduction of delta time requires time to do that, conflicting with the prior assumption of static universe. You cannot find the time to introduce delta because it's all static as per the definition.

Type 1 Time: Container + Dynamic Now
1. Incorporates an extra chronolium and chronodium as a N+1 container dium for N-dium universe.
2. The NOW is the transition boundary and moves from history to future, partially analogous to a growing crystal.
3. The Arrow-of-time direction is well defined: past to future.
4 Time travel is not ruled out, but not guaranteed either.

Type 2 Time: Dynamic Now
1. Requires no higher-cardinality dium to function in a N-dium universe.
2. Is an intersection dium with the universe providing a morphing ability to effect change.
3. No room for a history store, nor a future store, just a dynamic now.
4. Where a spatial dium provides storage ability but no change, a Time dium provides for change ability for a spatial dium.
5. The Arrow-of-time is not well defined, only a transition.
6. Time travel is ruled out because of lack of time storage.

The Dynamic Now object is self-sufficient for time progression. This object seems to be distinct from the static storage of temporal history which any container dimension can provide. This object seems to be a second kind of object distinct from dium. This may require an addition to the Dium Order.

6. Origin of Mass and Inertia

1. A particle with mass is in an equilibrium state when it's at the center of its warp in space.
2. The gravity well of a particle is more than a side-effect of the mass of a particle: the gravity well is the origin of mass and inertial effects of the particle.
3. When a particle is struck by another particle, it moves non-smoothly out of its centered position into a state of dis-equilibrium. It is the dis-equilibrium of the gravity well that resists this non-smooth jolt, not the particle. Therefore, particles with no mass, and thus no gravity well, have no inertial resistance to acceleration. It is the adjusting of the gravity well around a particle which is the origin of inertia. This decouples mass from inertia.
4. When particles with mass collide among themselves repeatedly they cause particle acceleration. This kind of motion exhibits the inertial resistance to acceleration by the particle because **the particle collision is inducing the motion and causing dis-equilibrium with its warp of space**. Thus a space ship launches from the ground with considerable acceleration forces felt by astronauts.
5. When a particle's warp of space encounters another warp, the warped fields themselves, not the particle, induce the motion of the field. When such a field-induced motion occurs, the particle is brought along with **no inertial resistance to the acceleration**. Thus a space ship already orbiting earth is accelerating and has no inertial effects.

7. Predictions

1. A particle and its warp of space **need not always be together**. If a particle is detached from its warp of space, then the particle has no gravitational field, thus no mass, and therefore is not affected by gravity. Such a particle has spatial extents, boundaries, and maybe charge, but no mass.
2. Correspondingly, the separated warp in space now has no particle associated with it, but can continue to exist. Since it is the warp in space that is the effect of gravity, **the warp continues to exert gravity** and is affected by gravitational fields. Such a warp in space without an associated particle is an ideal candidate for the elusive "**Dark Matter**" phenomenon. This is not a black hole. It is gravity without a particle.
3. Concerning "**Dark Energy**" and the seemingly accelerating expansion of the universe, Axiom 3 defines dium as energy. It's trivial to see there is clearly enough energy to expand the universe, but no mechanism is provided here. Here the solution is split into two parts: mechanism and energy to drive the mechanism. We provide a solution for the latter, thus half ways there.
4. There is no limit to the size of a rotor wave. A standing rotor wave is possible and is highly undetectable until intersected with.
5. If two equal but opposite rotor waves were superimposed, the *effect* of this is to net cancel their effect. However, **the two super-imposed waves continue to exist**. This is a way of hiding and storing waves/energy.

8. Fields and Particles

Opinion: It may be possible that dium are where the important scientific study should be focused, instead of the current particle based research, even for the search for intelligent life. Ie; it's possible the non-particulate universe is where the important action is, the particles being mere flotsam.

9. Extra - Razor and Question

1. Patricks Razor - **Natural dimension XYZ+T cannot be denied existence without also removing the x, y, z and t variables from equations.** The Dium is what provides these variables in the first place.
2. Patricks Question - What is natural dimension made of?

The Design of the Gravity Drive Attraction Engine

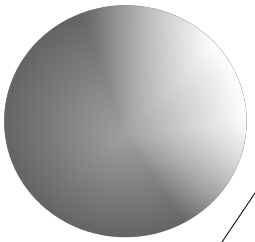
A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

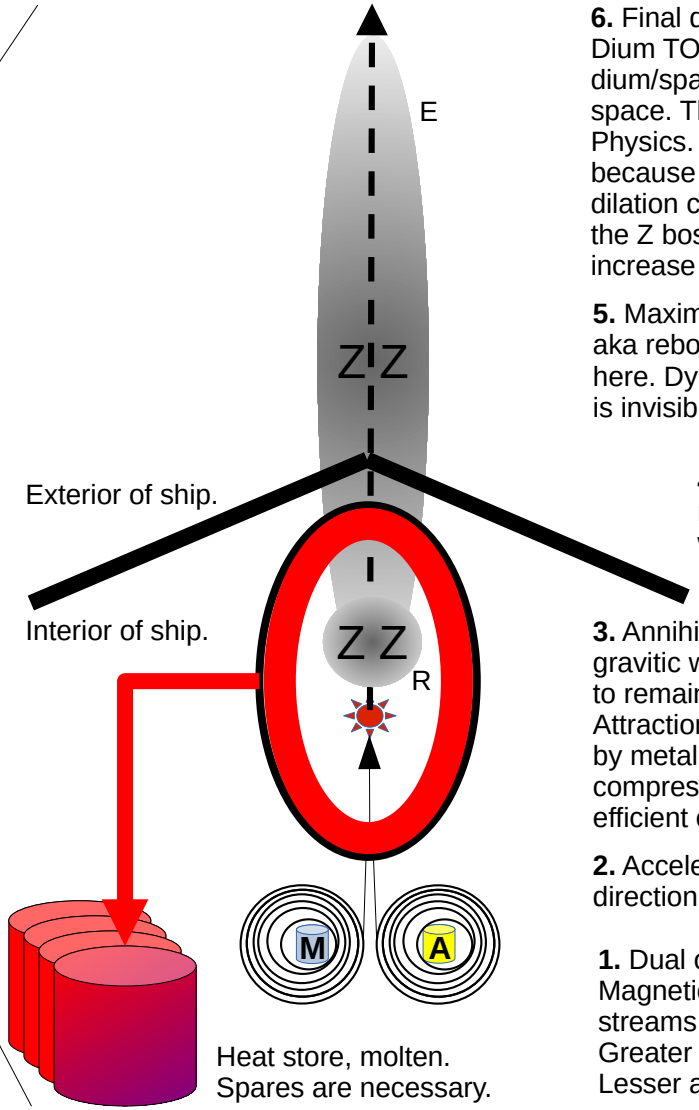
Gravity Drive Engine v3.2 explained both by Dium TOE and Standard Model Z Bosons (Weak Force)

IF alien space ships are real, THEN it makes logical sense to reverse engineer that engine from the observed properties! (A hypothetical)
THIS MAY BE THE FIRST ALIEN TECHNOLOGY SOLVED BY A HUMAN BEING!

Top View : Ship



Side View



Note1: 99% reduction of weight compared to conventional chemical Aerospace rockets. Only nose cone remains.

Note2: v1 and v2 of this gravity engine are in ebook “Penzar – Journal of Advanced Ideas”, Rael, P., 2011, Amazon

6. Final decay of Z bosons here, aka end of warp of space/dium. In the Dium TOE there can be a dynamic “warp” of space which compresses dium/space, and which if not held compressed will rebound back to neutral space. This correlates to the Z boson in the Standard Model of Particle Physics. CERN Z bosons are too short-lived and few to exhibit useful gravity because they collide head-on, canceling relativistic velocity. Einstein’s time dilation can slow down the Z boson decay to be useful. If it is preferred for the Z boson reaction to be entirely contained (R), slow velocity and/or increase angle of collision.

5. Maximum warp here (Z) from relativistic time-delayed Z-boson creation, aka rebound of space/dium. Attraction of material ship and occupants to here. Dynamic attraction point is always regenerating further ahead. Warp is invisible, colored grey here only for illustration.

4. Hull of ship doesn’t inhibit warp of space (gravity) (Z bosons) moving forward. Ship hull ideally presents a symmetric surface when viewed along axis of arrow for equal attraction.

3. Annihilation. Fast moving particles stretch time for Z bosons to maximize gravitic warp (mass) outside ship. Slower particles result in entire process to remain inside reaction chamber, still functions but less efficient gravity Attraction. Heat from annihilation is contained and absorbed/ablated by metal (eg; copper, iron) and is collected in heat store tank. Warp compression of space (massive Z bosons) begins. Annihilation is more efficient energy conversion than fusion, fission and chemical rockets.

2. Accelerators point matter/antimatter streams to annihilation point in direction of desired travel. Apparatus can be on a gimbal.

1. Dual opposite mini accelerators for Matter and Antimatter, or LAC guns. Magnetic containment bottles each for symmetry. Angle T of particle streams can vary:
Greater angle T annihilates closer to bottom, **rounder** (R) warp.
Lesser angle T annihilates closer to top, more **elliptical** (E) warp.

No. 020F, 2024-12-16 updated 2025-03-20

UAP/UFO Physical Ejecta is Evidence of a Heat Store

A Communication of the Intractable Studies Institute

Patrick M. Rael, Director, IntractableStudiesInstitute.org

Molten Ejecta from UAP/UFO

There are multiple confirmed reports of UAP/UFO ejecting material which is frequently molten and which cooled to solid or semi-solid state.

1) Big Lake Park, Council Bluffs, Iowa, 1977 - 1000 lbs (4'x6') of molten material dropped from observed saucer onto a levee, red and blue-sparkly hot, flowed down levy in molten hot state. Samples collected were tested as slag. Firefighters moved the cooled material out of the park to some place. An anonymous couple told computer programmer-turned UFO investigator Dr. Jacques Vallee they had seen, "a bright red object rocket to the ground near Big Lake." The Drakes told Jack Moore they'd seen, "something red fall out of the sky to the southeast, hit the ground and explode into flames." When Jack Moore arrived at the spot of the impact, he found a 4-by-6 foot "mass of molten metal" on a levee, according to The Daily Nonpareil. "It was running, boiling down the edge of the levee," Jack Moore said. "The center of it was way too hot to touch." Samples of the metal analyzed at Ames Laboratory at Iowa State University. "The metal turned out to be smelter slag", Francis Laabs of the Ames Laboratory, said. The Popular Mechanics article below says 40 lbs, but a 4'x6' mass would likely be > 40 lbs. 40 lbs is likely a sampled size, error.

2) Ubatuba shore, Brazil, 1957. As reported in May 2001 Popular Mechanics article "When UFOs Land", Jim Wilson, pp64.
A UFO reportedly exploded after hitting the water near the town of Ubatuba, Brazil. Metallic debris collected by a physician turned out to be composed of an extremely high grade of magnesium. A sample of the Ubatuba debris (...) examined under a microscope (...) revealed a higher level of purity than occurs in nature.
[NOTE BY PATRICK RAEL – most likely a steam explosion caused by the craft ejecting a heat store of molten material upon entering the water, not a crash]

3) Maury Island, Washington, 1947 - Multiple donut like craft were seen and ejecta caused harm and death.
On July 29, Arnold interviewed Harold Dahl, who reported: "On June 21, 1947 in the afternoon about two o'clock, I was patrolling the east bay of Maury Island [...] I, as captain, was steering my patrol boat close to the shore of a bay on Maury Island. On board were two crewmen, my fifteen-year-old son and his dog. As I looked up from the wheel on my boat I noticed six very large doughnut-shaped aircraft." Dahl said that one of the objects "began spewing forth what seemed like thousands of newspapers from somewhere on the inside of its center. These newspapers, which turned out to be a white type of very light weight metal, fluttered to earth". According to Dahl, a substance resembling lava rocks fell onto their boat, breaking a worker's arm and killing a dog. [NOTE BY PATRICK RAEL – ejecta isn't always uniform within a single dumping, some becomes thin and lightweight, some rocky, implying molten store can have multiple different material]

4) In the Popular Mechanics article above Jacques Vallee said "in at least 9 other sightings, aerial objects in distress were accompanied by the ejection of molten metal".

Simple Explanation

As there are several independent cases of ejecta from UFO/UAP, it is evidence that these ships have a common function that creates molten (heated) slag-like material. In the case of Big Lake Park and Ubatuba, Brazil the material was collected and analyzed. In the case of Maury Island the lava-like rocks broke a worker's arm and killed a dog, proof this was not some kind of dream. It is easy to deduce that the UFO/UAP ships produce this molten material most likely as a **by-product of their engine**. It has no value beyond storing heat since it is ejected. It would make sense that UFO/UAP craft engines produce heat, energy isn't free. The heat may be extreme enough to melt material **designed to ablate or conveniently acquired to ablate**. The heat is stored in a molten state. When the store is filled it has to be either cooled or ejected. What is being reported is the ejection use case. A craft could hover above water and dump the ejecta into water, boiling it into whitewater. If the craft ejected it underwater it would appear as if an explosion. The theoretical gravity-drive engine (Patrick Rael) produces extreme heat which ablates material into molten state which goes into a heat store. Dave Fravor, F-18 "Black Aces" Navy Pilot, describes the "Tic-Tac" ship above white water on a calm day. Molten ejecta into ocean will create white water from the explosive boiling. https://www.youtube.com/watch?v=Oz0p6QXHh9E