A Method of Moments
—
The Aesthetics of Redundancy in *Ikarie XB 1*

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"The method of moments involves equating sample moments with theoretical moments."[001]
"The method of moments equates sample moments to parameter estimates."[002]
"redundancy – the repetition of elements within a message that prevents the failure of communication of information – is the greatest antidote to entropy."[003]
"This patterning or predictability of particular events within a larger aggregate of events is technically called 'redundancy'"[004]

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It appears that narrative theory has yet to connect episodic stories with the statistical method known as "method of moments", but perhaps the digital humanities will get to this one day. As preparatory groundwork for that grand synthesis to come, I will venture my own method of moments in this essay, as the subject of interest is an episodic film, *Ikarie XB 1* (1963), and what is the episodic in general other than a method of moments? This chapter will offer poor statistical method but perhaps perform successful hermeneutics. My method of moments will proceed with the help of the closest typographic equivalent to a star, * or even multiple stars ** — to put us "in the mood" so to speak (establish the affect) for a reading of an interstellar space journey — and each moment in the episode of this essay will likewise be set off by a miniature cosmic void, the negative space of the symbolised

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001   *Method of Moments*. Available online: https://onlinecourses.science.psu.edu/stat414/node/193, [accessed 24/6/2016].

002   *Method of Moments*. Available online: http://www.itl.nist.gov/div898/handbook/eda/section3/eda3651.htm, [accessed 24/6/2016].

003   *Redundancy*. Available online: http://www.britannica.com/topic/redundancy, [accessed 24/6/2016].

004   Gregory Bateson, *Steps to an Ecology of Mind*. Northvale: Jason Aronson Inc. 1987, p. 414.

stellar, which gestalt psychology and phenomenology claim is the background which needs to be positively inhibited in order to produce a figure against it. In any event, today we have learned to handle miniature voids without incident or hazard, given that the CERN facility regularly produces microscopic black holes inside the largest machine ever built, with the same mundane regularity that dust bunnies accumulate at the edges of the accelerator.

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We are assured both by today's pop psychology commentators and the leading edge educational cognitivists that we have become accustomed to reading in short chunks anyway, due to internet browsing and staring at cellphone screens on sidewalks, "cellular zombies" sort of reading away, or at least looking at some-thing — so this essay will also act as its own "mobile app" version of itself, in its short spurts of easily digestible visual information.

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So both *Ikarie XB 1* and this essay about it proceeds by way of the episodic chunk, "chunk" used here in the strictly rigorous cognitive sense of "chunking":

> There are three straightforward sides to the chunking process — the search for chunks, the noticing and memorising of those chunks, and the use of the chunks we've already built up. The main purpose of consciousness is to search for and discover these structured chunks of information within working memory, so that they can then be used efficiently and automatically, with minimal further input from consciousness.[005]

My thesis: *to date we lack an aesthetic conception of applied probability, and a first step towards this perhaps is a systematic accounting of redundancy in an aesthetic artefact.* My writing strategy here is to exploit the probable, or the expectations of what a chapter like this should be like. I will attempt to conjure probability space to explore the emergence of redundancy, which is our general method for sorting out signal from noise in any inquiry.

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Ikarie XB 1 at the beginning (I will use an unitalicised "Ikarie" to refer to the spacecraft and "*Ikarie XB 1*" to refer to the filmic artefact) is a good exemplar

of what information theory conceives as redundancy. Language is said by informa-tion theorists to be 50% redundant, meaning that if half the letters or words were removed from a sentence, we could fill in the gaps through probable inferences. The film opens redundantly, by which I mean that the scene at the start of the film actually occurs much later — the film opens with a slice of the climax, actually the second climax as we shall see. A peculiar artefact of black and white film — we can-not tell what is wrong with the character's face (Michael) at the film's start. We are left with a menu of possible interpretive probabilities: 1) his face is muddy, 2) he sports a strange futuristic beard, 3) he has a skin condition, 4) he has eaten rather sloppily and has gotten dark pudding all over his face. We eventually discover that it is radiation burn from the Dark Star (not a dark pudding) later in the film, which will rule out mud and stubble as the probable source of blotches on his face. He is shouting that Earth never existed, his voice echoing in the metallic corridors of the Ikarie. He is looking directly at a glowing metallic and mesh-glass sphere affixed to the ceiling, which is both a light source and a video camera. Technologically speaking it is a reversible lens light, feeding a video signal back to the crew while also lighting up the corridors, which is an interesting idea for today's surveillance systems when you think about it — instead of separate mechanical fixtures on our walls and ceilings for lights and cameras, why not just combine them?

Ikarie XB 1 – A dual purpose video camera and lighting fixture.

There are other disembodied voices shouting at him, which allows us to know that his name is Michael. These voices do not seem to come from the glowing sphere, nor do they echo off the walls as Michael's shouts do. This is odd – it turns out that the audio of the disembodied voices is rendered from the perspective or "point of audition"[006] of characters on the flight deck. So we are visually in some corridor of the ship with a lone character but his shipmates speak with the acoustic

005   Daniel Bor, *The Ravenous Brain: How the New Science of Consciousness Explains Our Insatiable Search for Meaning*. New York: Basic Books 2012. cited in The Science of The Science of "Chunk-ing," Working Memory, and How Pattern Recognition Fuels Creativity from a blog Brain Picking. Available online: <https://www.brainpickings.org/2012/09/04/the-ravenous-brain-daniel-bor/>, [accessed 24/6/2016].

006   *Point-of-audition sound*. Available online: http://filmsound.org/terminology/point.htm, [accessed 24/6/2016].

signature of the remote space. In other words, it would be straightforward to add reverb to the crew's disembodied voices to place them diegetically in the ship's PA system, but the voices are dry (no echoes or reverberations), which renders two acoustic spaces simultaneously – the hallway where Michael runs around shouting with his dark-stained face, and the remote flight deck (which we do not yet know about) where the rest of the crew speaks.

All of this is clarified later in the film, where formal redundancy (that is, redundancy not at the root level of a single act of communication but in the narrative structure of the film) adds the missing context to this confusing opener. *Ikarie XB 1* is of course not the only film to begin with a scene explained later in the film, but here we will highlight its statistical function, namely to provide an act of meaning without context, which is a unique property of time-based media perhaps, because what painting or photograph or sculpture could ever perform a similar trick, presenting something confusing that becomes explained later? What is also explained later is that, before Michael acquired his darkened-by-the-Dark Star face, he had already been cracking up a bit, under the psychological pressure of redundancy – he lashes out loud at his colleague, losing his temper complaining of three redundancies in particular: 1) the redundancy of being on the lookout all the time for the ever-growing pinprick of light that is Alpha Centauri, 2) the redundancy of hearing his colleague say "I see" all the time as one of his speech habits, and 3) the redundancy of seeing the same faces of the crew all the time. Michael is starting to crack up under the pressure of pattern and its excessive demand for recognition in repetition. The human mind cannot take too much of redundancy, and this formal mechanism that is supposed to contain entropy in processes of information transmission in the case of Michael's unbuckling mind is actually starting to produce it, increasing the disorder of his pattern-recognising mind.

The glowing video spheres that hang from the ceiling, when viewed from another angle, are not actually spheres but rather oval-shapes that resemble to a high degree 1953's *War of the Worlds* extended monocular mechanical tentacular eye of the alien ships. We become more convinced that these lights are not really for illumination

Ikarie XB 1 – **The Ikarie has its own textual and graphic logo of itself.**

because the ship's architecture consists of numerous strips of light, or blips of light decorating columns. And yet, blinking light is not exactly something one can associate with a vocal presence. A bulb is not a speaker cone, even if set in the future. The voices trying to engage a meandering Michael emanate flatly in the mise-en-scène, not related to any particular audio technology, and not subject to the acoustics of echo, but become loosely associated with these blinking globular sphere-eye-cameras.

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When is it ok for a spaceship in a film to name itself? It would be absurd for the words "Millennium Falcon" to be displayed on any wall in the ship during the interior shots of any *Star Wars* (1977–2016) film. We can accept the words "Battlestar Galactica" stenciled onto the outside of that ship, because we are used to boats and battle cruisers having names on their hulls. It seems decorous for the Nostromo (mining ship of the first *Alien* (1979) film) to have its name mentioned in the textual overlay at the bottom third of the image, or mentioned in the dialogue. What spaceship in film shows off its name constantly, in scene after scene, painted on the wall of the main deck, and not only its name but also including an outline of the ship's shape? This improbable set design element is a feature of the *Ikarie*. It is a spaceship which is very concerned that you might forget its name! (is it the additional "XB 1" designation that causes this strange concern with its own identity or brand presence?). The Ikarie is like a logo of itself, an intruding product placement for its own non-existent commercial brand. Perhaps the film's producers were worried that overseas, other countries would re-name the ship, in the overdubbed dialogue or film's title, and so it is forever preserved in the very fabric of the medium, where it can't be messed with (and also to hit us over the visual head with a redundant reference to the ancient Greek myth). This visual element is also a subsonic element, the ship continually whispering its own name – to us, to the crew, to the AI, perhaps even to itself, a reflexive ship.

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We are all already victims of aesthetically applied statistics. Every film recommendation we have ever received by an online video streaming service populates our screens with statistically modeled thumbnail jpeg movie posters of other films that we should be wanting to view, based on past ones we have watched. The inaccuracy and inanity of this technology doesn't stop the companies that produce the algorithms for such shoddy "prediction" from $1 billion venture capital valuations in Silicon Valley. Today's junk science is joined by junk algorithms. Due to anomalies not in statistics but in contemporary digital distribution platforms, *Ikarie XB 1* of course is not likely to be recommended after viewing the latest Tom Cruise adventure in which he falls in love with a supermodel while needing to kill aliens.

The Ikarie is also full of junk science, particularly "avitaminosis" which apparently is the lack of vitamins in an interstellar context. The speed of light does strange things, since on the ship live video conferencing is possible with earth but without latency, even as the crew experiences time dilation, so recently and poign-

antly explored in Christopher Nolan's *Interstellar* (2014). Half a century before the contemporary consumer wave of "smartwatches", the crew of the Ikarie is already sporting them (though they call them "transmitters" in a film in which many other things are also transmitters!). The Ikarie also has a lab that produces "unicells" but we don't find out what those are or do. One of the crew wants to genetically engineer flowers for a female historian on board as a cue to romance — since unicells can produce seeds, he settles on a sunflower. The scene where he takes the instantly produced sunflower to the historian's cabin reveals an interesting facet of the ship's control room culture — the senior officers use the Ikarie's surveillance system for fun and games, for instance prompting the female historian that someone is at her door (note that women on the ship do "soft science" such as history or sociology relative to the hard science men[007]), so that she catches the sunflower wielding young man off guard outside her door, since he had been fluffing up the sunflower. She invites him into her cabin, and back in the control room, a senior officer asks to have the camera switch to the cabin view, which turns out not to be possible since hers is a "private cabin". However, this surveillance system-based pastime of the senior officer allows for interesting off-screen sonic effects, whereby their conversation is superimposed on the silent video footage of this romantic encounter elsewhere in a hallway of the ship. Here surveillance technology is employed in a prankish manner by senior crew who use it in a juvenile manner, instantiating one of many moments where a video feed is transformed into a kind of silent film footage.

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In sci-fi films of this era — unlike our time where almost every sci-fi film defaults to either a drone-a-thon or a drum-a-thon of a score — the electronic sound palette was still exploring its possibilities, probabilities and redundancies. An interesting aesthetic feature of *Ikarie XB 1* is the quiet subtle underscore of percolating electronic tones that meander in and out of scenes, sometimes as springy and reverberating pizzicatos in feedback loops, sometimes in long and somewhat random extended tones, varying between machine-like and instrument-like associations. This renders indeterminate these sounds' "status" as either sound effects or music. Should we be experiencing these quiet meandering electro sounds as being produced by all of the electronic gear, or are we listening to a score setting up mood and affect? Is the sound related to all the blinking lights (that strangely do not hum), or is this the music score of the future? In real life indeterminacy in

our mental model is error-corrected by continuous sensory input that updates the model, as might occur, for example, in briefly mistaking a stray slipper in the corner of our peripheral vision for a rat. But in art, these indeterminacies are directed not at correcting the model but rather in disrupting it. These electronic textures take aim at our filmic categories of music and sound effects, and present a continuous sensory input that invalidates these categories.

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I have discovered that I already know this composer without knowing it, Zdeněk Liška who also composed for some of Jan Švankmajer's famous films and animations. Liška is playing a very interesting musical game that no one plays anymore. It was a kind of '60s game to play. The game goes like this: make acoustic music sound like electronic music. Maybe today that sounds a bit didactic or esoteric, but it was a consequence of composers of the time dealing with the eruption of an entirely new sound palette opened up by electronic technologies which came to co-exist alongside acoustic instruments, just as painting never disappeared with the introduction of photography but rather the two technologies evolved practices which cross-fertilise each other until even today.

Liška appears to be a little ahead of his time, or at least at its leading edge. In the 1950s composers combined live performance of acoustic instruments with tape-based or other electronic music, typically in a contrasting manner, which emphasized *the difference* between acoustic and electronic sounds. But Liška's approach isn't just antiphonal, but rather indeterminate at the level of timbre. To get a sense of what was happening in electronic and acoustic composition during this period, here is David Cope on the aesthetics of 20th century art music in the '50s and '60s with respect to the combination of acoustic and electronic music:

> Henri Pousseur (b. 1929), in *Rimes pour Différentes Sources Sonores* (1959), treats orchestra and sounds on tape as antiphonal bodies, contrasting the available materials of each (the tape in this instance is constructed entirely from electronically originated sounds) [...] Otto Luening (b. 1900) and Vladimir Ussachevsky, who worked together on *Rhapsodic Variation for Tape Recorder and Orchestra* (1954), were among the first to realize and experiment with live and prerecorded sound sources in America, while Bruno Maderna (in *Musica su due Dimensioni*) had begun studies in this area in 1952 at the NW German Radio in Cologne. These earliest examples, like the Pousseur, extended the contrast possibilities of live and recorded sources.

As it became apparent that instruments were capable of a large variety of sonic materials, complementary possibilities of electronic and instrumental sounds became a reality. Donald Erb (b. 1927), in *In No Strange Land* (1968) for trombone, double

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007   A point made by Eva Näripea in *Work in Cinema: Labor and the Human Condition* however she misses that there is also a sociologist on board the Ikarie. Thus, since human knowledge is often parsed triadically across Natural Sciences, Social Sciences and Humanities, the female crew could be said to comprise 2/3rds of the knowledge spectrum, leaving purely quantitative knowledge to the men. However, at least this depicted technological man-acumen is applied towards genetically engineering sunflowers to woo the women on board! See Eva Näripea, Work in Outer Space. Notes on Eastern European Science Fiction Cinema. In: Ewa Mazierska (ed.), *Work in Cinema: Labor and the Human Condition*. New York: Palgrave Macmillan 2013, p. 218.

bass, and tape, reflects more imitative techniques, employing the instruments in neoclassical sound effects, thus minimising the musical and sonic disparities between electronic and instrumental materials.[008]

In Liška's score we find both approaches, actually – the electronic and instrumental instruments are at times contrasted antiphonally against each other, but there are also fascinating "imitation games" (to borrow the name of a recent popular film) between electronic and acoustic instrumental sound sources. Note that Liška is doing this imitation game, or closing the difference and distance between acoustic and electronic sound sources, five years before Erb, which makes this score deserving of recognition for its avant garde approaches. But Liška also plays this imitation game with enough subtlety that it actually becomes another game. His game goes like this:

This is a sci-fi film, and thus you are being exposed to an electronic score, because sci-fi film should have the latest newest musical gear producing the music. So get into the mood of these electronic sci-fi scored visuals, get into the world of this film…but some minutes later you suddenly notice that you are now listening to an acoustic score played by familiar orchestral instruments. When did that shift or transition occur? Precisely! You don't remember it — that's the game!"

Liška plays this game more than once in the film, but my game with the reader is: now you know what game to look for, go watch and listen to the film and find these moments yourselves! The imitation game played here is not to crack the code, but to combine codes in re-mixing the difference between the electronic and the acoustic.

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I really hope you are poeticizing these little asterisks and imagining them to be stars viewed out your spaceship's portholes, so like vacationary cruise ship portholes (redundancy at work), because that's why they are there. It is part of putting you in the mood to view or re-view *Ikarie XB 1*, an episodic journey through the cosmos but, one has to say, also a very linear one. Like many episodic narratives (think the Odyssey, with its start point at Circe and end point at Penelope), the Ikarie unfolds its episodes in a *Go From Point A to Point B* trajectory, or in other words, from the old Earth to a new planet.

008   David Cope, *New Directions in Music*. Dubuque: W. C. Brown 1971. pp. 92–92.

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As mentioned above, the film begins at one of its climaxes, then in order to set the narrative clock back to a preceding scene, from which the film will progress to where it began, uses as a transition device an extended explanatory voiceover sequence. Cuts to interior shots of machine banks full of blinking lights create the visual premise for a voiceover narration that suddenly gives the backstory of the plot premise, namely that eight years of training at a space station have prepared the Ikarie's crew for a long space journey to Alpha Centauri, to see if there is life on one of its planets, because that star isn't so far away compared to other stars, only 26,000 light years away!

This voiceover is densely multi-layered compared to most explanatory voiceovers, because it mixes genders and age groups (e.g. children and adults), and appears to be intended as a collage of radio newsreels that fill in the journalistic perspective on the voyage. This "newsy" collage of sonic newsreels is delivered flat and rendered as plain speech, devoid of the accoutrements of actual newsreels, such as authoritative male voices, sound effects, radio noise, brass instruments and string sections. Like the crew members' PA-system emanating speech non-resonating in the hallways at the film's opening, this voiceover explanatory radio newsreel collage is delivered as unadorned theatrical speech, literally de-spatialised and de-mediated (i.e. rejecting tropes of remediation, or in short, not trying very hard to convince us that this is a collage of radio clips).

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So the score sets out to trick us, performing very slow phase shifts between electronic and instrumental tonalities so that we listen in a zone of general indeterminacy — are these electronic instruments imitating acoustic ones? or are the instruments of the orchestra being bent out of shape by avant garde compositional techniques (called "extended techniques" in music theory), made to sound like electronic ones? or is this score a mix of electronic and acoustic technologies? For music, the '60s was the kind of moment that hadn't been seen in art history since the rise of photography which produced the revolutions in painting, the chain of events from Impressionism to the various Abstractionisms and Formalisms. Where photography was the great 19th century technological "disruptor" of the painters, stealing their jobs then as robots steal jobs today, the '60s offered this play-zone where new worlds of sound were introduced by electronics and the acoustic techniques evolved in parallel, similar to painting and photography. Today film scores gives us virtual sampler banks which reproduce the classic sounds of acoustic instruments, but they don't try to fool us into wondering whether the sounds are acoustic or electronic. Our auditory thresholds have long since adjusted to the introduction of electronic sound, but if you want to know what it was like for electronic music to still be new, listen to *Ikarie XB 1* and listen across the textures of Liška's indeterminate sources.

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Today we talk about "performance metrics" and "benchmarks" for pretty much every facet of social experience. How was your shopping experience while out buying tomatoes? Please fill out these Likert scale items so we can improve our target over last year's scores. Today ubiquitous computing and soon the internet of things will benchmark every footstep and cough and snore and produce performance indicators for the number of chomps we apply when we chew our food or track food particles on the tip of each bristle to let us know how well we have brushed our teeth. So, if we want to benchmark *Ikarie XB 1* against the best performing sci-fi film soundtracks of its historical era, these filmic equivalents to the S & P 500 index would be *Forbidden Planet* (1956) and *2001: A Space Odyssey* (1968). The former ran into trouble with Hollywood's musician unions, and so had to title its score work, in the film's credits, "electronic tonalities" instead of, for example. "music." *Forbidden Planet* was the first fully electronic film score of a feature film and broke new ground in cinesound. The score of *2001* gave us mostly a narratised battle between Ligeti and Strauss, as though Kubrick wanted to set up a dialectical encounter between the classical forms and the newer extended timbres and structural possibilities of "new music.". However, it is a poor dialectic because these two polar musical possibilities are like two sport teams sitting on the benches staring across the court at each other, unreconciled and not even out in the game playing with and against each other. Ligeti and Strauss are more like lone figure skaters, each taking turns one at a time, to show off what they can do and how they do it, depending on how "alien" or "earthy" we want the film to be in a particular scene. Liška gives us the earthy aliens, or alienated earthlings, and offers a more truly dialectical aesthetic in the conflict zone of the new sounds in emergence.

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Installed aboard the Ikarie is perhaps the funniest AI computer ever rendered on film. *Team America World Police* (2004) gave us the AI computer I.N.T.E.L.L.I.G.E.N.C.E. but this was long after "military intelligence" had entered the popular lexicon as an oxymoron, and I.N.T.E.L.L.I.G.E.N.C.E. is one-dimensionally stupid. However, Ikarie's AI features Deep Humour rather than today's computational buzzword Deep Learning. The constant failure of the ship's AI to calculate appropriate meaning is the film's best through-joke, and we can write about it here because the AI's voice is accomplished via what appears to be mixing together of vocoding synthesis with an actor's unprocessed voice. Vocoding for AI and robots is a standard trope in sci-fi — Kubrick gave us a human voice for Hal, while in *Forbidden Planet* the character Robbie the Robot gave us a man's voice inside of a cavernous helmet. So the AI's vocal texture would be considered, using sound mixing terminology, a "wet/dry" mix, or part vocoded and part unvocoded:

A vocoder is an audio processor that captures the characteristic elements of an audio signal and then uses this characteristic signal to affect other audio signals. The technology behind the vocoder effect was initially used in attempts to synthesize speech…
The input signal (your voice saying "Hello, my name is Fred") is fed into the vocoder's input… The audio output of the vocoder contains the synthesized sound modulated by the filter created by your voice. You hear a synthesized sound that pulses to the tempo of your voice input with the tonal characteristics of your voice added to it.[009]

As the AI starts to become an actual character in the story – rather than just the autopilot – we discover that the crew regularly, as part of the ship's culture, tries to deliberately confuse it, such as by asking the AI for "smoked bananas" in the mess hall. However, this is redundant because the AI confuses itself anyway, without being subject to an explicit gag by the crew. For example, humans that pass out on the spaceship produce AI alarms of "Dead Person! Dead Person!" which show that the AI cannot distinguish between death and sleep. Regularly throughout the narrative the ship's crew make fun of the stupid utterances of the AI that also happens to be keeping them alive and fed, the ship on course, the life support systems operative, etc.

The ship's AI (we will also call it "Centrální Automat" because the AI frequently names itself in the first line of its speech, much like reading a play tells you which character is speaking) is introduced in the same scene in the mess hall with another pseudo-AI, the old robot Patrick, which has been brought on board as a "personal item" of the character named Anthony Hopkins. Patrick speaks with a more fully vocoded voice, and like the ship's AI, malfunctions more than functions. It would appear that in the world of *Ikarie XB 1*, the entire field of cybernetics is basically a joke, a failure at communication and control on the one hand, and information and meaning on the other. Introducing the ship's AI and an old clunky robot pseudo-AI (we are told the robot is a bit outdated, by some decades), is an interesting piece of formal redundancy in the plot. The ship's AI is a disembodied semi-vocoded voice whose presence we infer to be imbued throughout the whole ship, while Patrick with his fully vocoded voice mechanically churns out random factual information, such as the weather. Patrick repeats useless information and his guidance system experiences control issues, since he tends to roll off in the wrong direction as controlled and intended by his owner Anthony Hopkins.

This introduces an interesting aesthetic dilemma, namely how to introduce multiple robotic or otherwise artificial characters, which like any characters need to be differentiated from each other? *Star Wars* of course gives us multiple robots, and the aesthetic solution here is obvious in the difference between R2D2 and C3PO (one is tall and talks with a British accent, the other is short and beeps). The AI and Patrick are at first hard to distinguish in their audible parameters (fully vs. semi-vocoded) and their physical differences amount to a disembodied voice

009   *Vocoder*, available online: http://whatis.techtarget.com/definition/vocoder, [accessed 24/6/2016].

that floats throughout the ship, and a clunky robot spouting verbalised data and wandering off in the wrong directions, but their voices are similar. Such a dilemma would not occur in the novel because an AI and a robot would have no opportunity to sound alike. Like today's ambitious computers that are said to perform 'machine learning', Patrick teaches himself dumb sayings that make the crew laugh.

Ikarie's idiotic AI makes this one of the most relevant sci-fi films to view today, in our era of Machine Learning, Google's Tensor Flow, Self-Driving Cars, Big Data, robots with pseudo-AIs, AIs being used by banks to offer investment advice, AIs predicted to sit on corporate boards, clutzy algorithms that recommend films that no one wants to see, and so on. *Ikarie* embraces a future not in which the AI is brilliant and goes mad (*2001*), nor a robot that can synthesize anything in its mechanical belly such as booze and gems but is ultimately controlled by a megalomaniacal human genius (as in *Forbidden Planet*), but rather an AI that just keeps saying stupid stuff surrounded by a crew that is always making fun of it. One wonders if the idiot AI was programmed to be idiotic intentionally, in order to provide opportunities for the crew to communally have something to laugh at — good social psychology for long space flights in which everyone has to share the same light speedy tin can.

Today it has been said that there are five camps of machine learning, which try different approaches to producing smarter machines[010]:

- The Symbolists: filling in gaps in existing knowledge
- The Connectionists: mimicking the human brain
- The Evolutionaries: simulating the evolutionary process
- The Bayesians: reducing uncertainties
- The Analogisers: making contrast between old and new sets of information

Ikarie XB 1 gives us one more category — The Comedic Ironists, who don't believe that computers can ever be made as smart as humans, whose algorithms will often spit out gibberish, and that such gibberish is actually useful in the social psychology of space travel, because to endure the long flights to other planets, it helps with group cohesion for everyone to be able to make fun of the computer that runs everything.

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One problem for the film scores of sci-fi films is that music also exists in the future and it needs to be rendered, but how do you render the music of the future when your film's music is also rendering a futuristic storyworld for present audiences? Perhaps this is why Kubrick embraced Strauss, falling back on the

010   Shannon Kempe, Pedro Domingos' on "Five Machine Learning Tribes" on Dataversity, 27, 10. 2015. Available online http://www.dataversity.net/pedro-domingos-on-five-machine-learing-tribes/, [accessed 24/6/2016].

Ikarie XB 1 – Patrick with his "owner" Anthony Hopkins and another crewman.

narrative grandeur of cinematic and classical style and then bringing in the weird contemporary academic art music to symbolise alien stuff.

Has a study been made of the depiction of futuristic music within the diegesis of the sci-fi film? Such a project would require a crowdsourced methodology, given the scale of the research. Amongst the worst offenders would be the Cantina Music of the first *Star Wars* film — which presents aliens in a pseudo-seedy bar playing a clarinetized muzak— and amongst the best would be *The Fifth Element's* (1997) Diva Song, in which a blue alien lip syncs a tear jerking aria actually sung by Evgenia Laguna, which is remixed with an electronica beat halfway through the song in order to coincide with the edits of a fight scene cross-edited elsewhere on the space station. *Forbidden Planet* runs into real problems when the ancient classical music of the dead Krell alien race is played from its archive and…sounds pretty much like the rest of the film's score! A score of only electronic tonalities produces a failure in diegesis, since the music that is supposed to be diegetic is aesthetically indistinguishable from the nondiegetic score. Maybe we're not supposed to notice.

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There is a grand piano onboard, but when introduced the crewman playing it is just practicing his *do re mi* musical scales, going up and down the keyboard. This future doesn't seem to know what to do with a grand piano. Moreover, another crewman comes along and tells the scale practiser that he is striking the keys too hard. The scales repeat, looping with increasing complexity and indeed are played lighter, as the music from the piano practising room drifts throughout the ship and into the next few scenes, becoming a soft pulsing abstraction of scale patterns intermittently interrupted by the lilting sighs of the mechanical doors.

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Ikarie flirts with the limpid and listless throughout. There is the not dead "Dead Human! Dead Human!" that is the butt of the AI jokes. And then there is the Futuristic Birthday Dance of Listlessness. The listless dance involves matching

opposite shoulders with one's partner in a slow bobbing motion with a narcotically looping phrase of four notes. While some partners show the occasional slow motion hand twirl, most keep a uniform gap between bodies, just shifting their shoulders left to right and back again. The birthday dance scene, with its "music of the future" sounding very acoustic rather than electroacoustic, is viewed via the surveillance system by a lone captain on the bridge. He suddenly hits the sound button to watch the dance in silence. So a motif (a form of redundancy) in this film is the viewing of silent moving images, as the dance continues in silence. The Ikarie's surveillance system is sometimes used to produce silent movies of its crew, whether dancing listlessly or door-delivering genetically and romantically sprouted sunflowers. These moments where the soundtrack is literally lost — audio-mixed out of existence — bring the absolute silence of space into the halls of the ship.

Interestingly, the listless dance is followed by a dance called "jiggling" which is peppier and more upbeat with its looping staccatos. It is interesting that all the music of the future — whether practising scales, dancing listlessly, or jiggling — involve musical figurations of pure repetitive (redundant) loops — we can almost hear Michael shout out: "Stop playing all the same notes over and over again!" If information theory considers language to be 50% redundant, the acoustic instrumental music of the film, and by extension, of the future, tends to be 100% redundant. This is an interesting compositional inversion, as the traditional instruments of jazz band or chamber music are utilised as though they were running computer loops. The music of the future, predicted somewhat presciently, is a loop or a series of overlapping loops or loops followed by yet always more loops.

The birthday dance is interrupted by electro air raid sirens, and the very vocoded voice of "Centrální Automat" (the Master Computer) who reduntly announces who it is that is speaking — as though the ship's crew would not recognise the voice of the AI that runs the ship! Here the Centrální Automat AI is sounding very official and clarifies that this is not some kind of fire drill — rather, an "object of the 7th order" has been detected in the "2nd safety zone"! Centrální Automat orders everyone to their posts immediately.

*

Another redundant loop — in almost every cutaway scene in which we see the *Ikarie* fly through the void of space, it is always progressing screen right to screen left, and at a somewhat upward diagonal vector. It even appears to be the exact same footage repeated several times throughout the film, to remind us what the ship looks like — which is redundant because the ship is also a visual element in its own interior decor. The whole film is a bank of loops. A loop bank.

The discovery of a derelict spaceship along their way to Alpha Centauri is scored with a looping pattern of beeps that appear to be inspired by Morse Code patterns. This backgrounds a conversation on how best to approach potential aliens (since organic matter has been detected on the spaceship) — the senior scientist argues that the crew must do more than beam over the Pythagorean theorem. The

narrative grapples with the nature of meaning and information, in the problem of how to communicate with alien life. Redundant patterns abound — for example, two men are sent to the ship (instead of two robots — we know by now that the machines aren't so astute in the production of meaning, so they would be useless ambassadors for alien life!). The docking of the shuttle on the derelict ship is scored by a lovely collage of chirps, blips and scraping metallic drones. Upon boarding the ship, the score shifts to instrumental acoustic music, as the two Ikarinauts who board the vessel realise that the ship is actually ancient and of Earth origin. The ship is full of dead bodies, many of which are clutching money, having been playing poker in the ship's chemical weapon supply closet.

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Another anomaly (anomalies being low redundancy phenomena) the high informational (low redundancy) name, "Tigger Fun." This word seems to prove the point that in information, high information is akin to no information, much like totally redundant repetitions. Tigger Fun maps poorly to anything else in language. It remotely associates with "trigger happy" perhaps, but "Tigger" is also a cartoon tiger of *Winnie the Pooh* fame. The name of this "clean weapon" (its purpose is to kill people and leave objects intact, just like a neutron bomb) has an interesting redundancy to it — Centrální Automat mentions that the weapon has another name — "Tigger Breath." 'Tigger Fun' is a kind of name game, highlighting the need of names for contexts in order to convey their meaning, and so becomes a signifier without a signified. It is a mystery word more mysterious than *Citizen Kane's* "Rosebud." "Rosebud" at least maintained semiotic redundancy — rosebuds are recognisable things you can buy at the floral shop — and "Rosebud" also turns out to be the name of Kane's childhood snowsled. So the Mystery Word "Rosebud" is anchored by these two supports — the referent of actual rosebuds and its discovery in the film eventually of what it actually refers to, so it is a solved mystery word. However, the name 'Tigger Fun' just hangs suspended like a derelict space word, with no semiotic anchors other than the chemical weapon canisters that look a lot like giant firecracker rockets.

Another set of redundancies — some of the collapsed bodies look pale and emaciated, resembling victims of the Holocaust — which can be redundantly associated with an earlier comment by an Ikarian scientist, that one of the metals detected in the hull of the ship is "germanium". Thus this poison gas Tigger Fun/Tigger Breath (aka neutron bomb) has an informational link to other historically significant poisonous gases. The neutron bomb was prototyped in 1962 and weaponised in 1963. Thus *Ikarie XB 1* seems to imagine the neutron bomb as the new genocidal weapon of choice.

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Morse Code is not just used as a mimetic device for triggering musical composition possibilities — Centrální Automat sometimes also speaks by ending his sen-
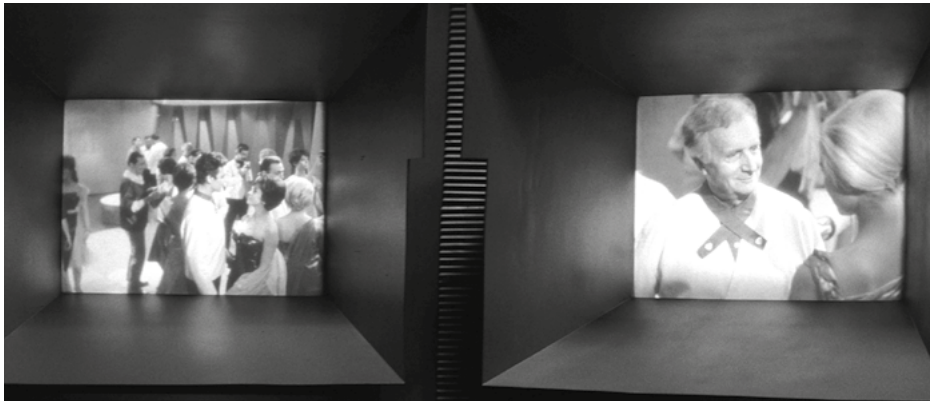
Ikarie XB 1 – The "silent films" produced by turning off the audio in the surveillance system.

tences "stop" in the manner of Morse Code. In speech, one does not of course need to end sentences with "stop" since practice and pauses let the experienced listener know where the break is between spoken sentences. But the Master Computer appears to make category confusions, speaking as though it were sending telegrams.

*

Another informational redundancy at the formal level of the plot: the two Ikarinauts who have boarded the derelict ship encounter two corpses in the cockpit. By inferring a chain of cause and effects, they figure that these two killed everyone else with the poison gas in order to extend the oxygen supply, then turned on each other in the end. This will be redundantly repeated when the two Ikarinauts accidentally trigger the ship's nuclear weapons, so they will die as an astronautical couple as well. However, note here the redundancy of the ship having both nuclear weapons and poisonous gas weapons. It is doubly cutting edge in terms of lethal weapons technologies. Just as the Cold War Superpowers could redundantly annihilate each other a dozen times over with their "MAD" weapons (mutually assured destruction), so this derelict ship launched in the film's future of 1987 is overloaded with deadly technical capacities. Interestingly the nuclear weapons are triggered by the magnetic boot of one of the Ikarinauts, who happens to accidentally fall into a little mechanical crevice, which moves a lever with his big boot, which triggers the nuclear detonation. This is interesting from the perspective of tracing energetic forces across system levels – the bodily kinetic force of a human leg, amplified by a magnetic boot, trips a mechanical lever, which sets off a nuclear detonation in space! This is truly "human machine coupling" as the design field of this era (circa 1963) conceptually framed our human interaction with our technical systems.

*

Note another redundancy that occurs when the nuclear weapons detonate – the brilliant flash of the explosion seen directly through the portholes of the ship (rather than through a video surveillance system) causes the viewers to clench their

eyes in pain, just as Michael's blaster aimed at the video spheres had done earlier, overloading the video signal and making his remote viewers clench their eyes as well. Everything in this film happens at least twice (recall that even the birthday dance presented two dances, a listless one and a jiggling one). This detonation which kills two Ikarinauts is scored with a beautiful silence. For perhaps 15 seconds there is not a single sound in the film, so the film as a whole becomes a silent film. Previously the silent film effect had been produced by losing the audio of the video feed, another way in which this scene references a previous one, when the surveillance sound had been turned off during the dance, or when the sunflower was delivered in the silence of a monitor.

In the scenes following this accident, the piano practice room returns as a place of real melody and melancholy, rather than practising repeating scales. Melos prolongs the sadness of these moments. Mentions of Hiroshima and Auschwitz work their way into the dialogue as general ciphers of "the 20th Century", adding new redundancies. This is countered by the name "Honegger" which redundantly names the composer who is the source of the music we have been listening to during this narrative mourning phase.

* *

"The idea that communication is the creation of redundancy or patterning can be applied to the simplest engineering examples."[011]

"[T]he nature of 'meaning.' pattern, redundancy, information, and the like, depends on where we sit. In the usual engineers' discussion of a message sent from A to B, it is customary to omit the observer and to say that B received the message from A which is measurable in terms of the number of letters transmitted, reduced by such redundancy in the text as might have permitted B to do some guessing. But in a wider universe, i.e. that defined by the point of view of the observer, this no longer appears as a 'transmission' of information but rather as a spreading of redundancy. The activities of A and B have combined to make the universe of the observer more predictable, more ordered, and more redundant."[012]

"If I say to you, 'It is raining,' this message introduces redundancy into the universe, message-plus-raindrops, so that from the message alone you could have guessed – with better than random success – something of what you would see if you looked out of the window."[013]

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Perhaps somewhat in the spirit of the repetitive blips of Morse Code, Michael recommends to his crewmate who is expecting a child that he name the boy

011   G. Bateson, op. cit., p. 414.
012   G. Bateson, op. cit., p. 414–415.
013   G. Bateson, op. cit., p. 415

A Method of Moments — The Aesthetics of Redundancy in *Ikarie XB 1*   Michael Filimowicz

Michael (presumably after himself, he who had earlier yelled at his colleague out of frustration with redundancy!). Michael is the first character to collapse due to the effects of dark radiation, experienced during a repair spacewalk. Centrální Automat repeats in a looping monologue:

> "Lying person. Lying person. Non-respondent person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person. Dead Person..."

But Michael is not dead; he has just become unconscious. Thus we learn that when this AI self-learns, it errs, proceeding from an unconscious person to a false conclusion, that the character is dead. This is the philosophy of machine learning espoused by the film – machines can repetitively note data, but when it tries to think it makes poor inferences. Since the true role of the AI's poor thinking is to provide a narrative premise for jokes, in the period following reviving Michael, everyone jokes about being announced by the AI as a dead person on board (e.g. eat your meal in the mess hall or the computer may pronounce you dead from malnutrition!).

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Before they can reach Alpha Centauri, they have to deal with a plot device, namely One Last Obstacle to be Overcome before reaching their destination. This plot device is the Dark Star, which emits a dark radiation that doesn't fit into known science. Note that all the contemporary theories around Dark Energy date from the 1990s, however the theories around Dark Matter date from the 1930s. The Dark Star encountered by the Ikarie emits a phantom radiation that puts everyone to sleep, including potentially the film's audience! The dramatic action produced by the film's big sleep event is that no one knows for sure if they will ever wake up. However a scientist assures everyone that his calculations have shown that everyone will wake up in 60 hours.
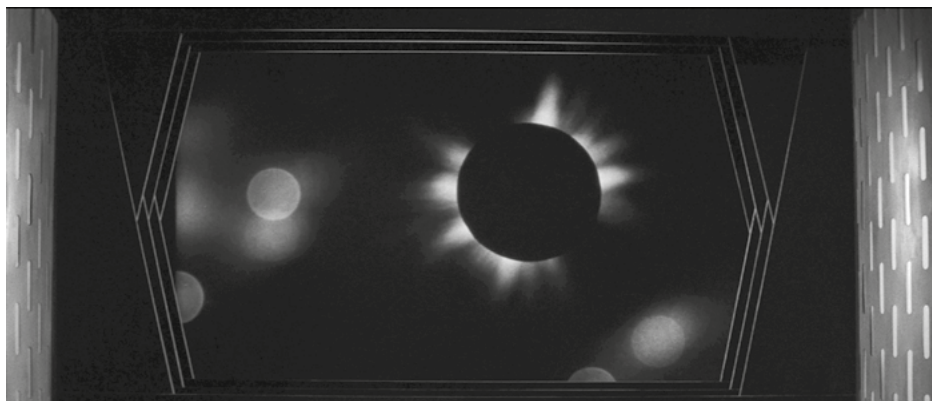
Ikarie XB 1 – **The Dark Star, which emanates narcoleptic radiation.**

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Towards what should be the film's climax, all the characters pass out. The climactic struggle is actually the struggle of the ship's crew to remain awake. This is profoundly interesting from a narrative perspective. Any film's climax is supposed to be the epitome of action, emotional intensity, the moment of all fight scenes, explosions and car chases, etc. But consider *Ikarie XB 1:* at the exact moment when all the action is supposed to reach the apotheosis of intensity, everyone is basically collapsing on the floor or furniture. The film presents a gigantic dimple at the very tip of the narrative arc, as though a meteor has crashed and left a great narratological dent right at the moment when everything is supposed to get really exciting in the film. There are of course non-narrative films, flat deadpan films, abstract films, etc. which reject traditional narrative structures. But a film which progresses towards a climax, episodic though it may be, with a clear climax point (the radiation from a dark star as it approaches the destination planet) — and then everyone just falls asleep at the exact moment indicated by the narrative arc that they should be at their most excited. This is not anti-climactic but rather climactically unclimactic. This makes *Ikarie* a statistical anomaly.

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The climax of the film – which is everyone falling asleep – submits the audience to a prolonged exposure not to radiation, but to repetition. The lights flicker in overlapping pulses of clocklike regularity. The AI continues to run the work shifts on schedule, offering food at the preprogrammed times, for no one to eat, unable to learn to change its behaviour and adjust to the fact that everyone is sleeping. Patrick wanders around vocalising "Anthony. Anthony." This climax of narcolepsy appears to be an experiment conducted on us, the audience, to see if the film can hypnotise us, if it doesn't put us to sleep first, with its repetitive hypnotic score and shots of empty interiors.

Centrální Automat is able to declare "Normální Režim" at the exact time when everyone wakes up, allowing the "autoregulation process" to resume and as well – a more normal progression of time for an audience who has been subjected to the Dark Star's narco-hypno radiation which has slowed down the film's narrative tempo while the ship has passed by it – in effect, the AI's declaration of "Normální Režim!" functions like a hypnotist who snaps us out of this narco-radiated spell of sheer redundancy.

The Dark Star gives the narrative its link to the myth of Icarus, but instead of melting wings we get narcoleptic astronauts. And also a continuation of the main running joke, since it gives the ship's AI ample opportunity to churn out announcements of "Dead Person! Dead Person! Dead Person!" as all the crew falls asleep, knocked out by the phantom hypno radiation.

The captain shouts out that until the sickness becomes an official disease, has a name attached to it, it doesn't exist. Nothing has meaning without pattern and repetition. A biological condition that goes un-named lacks either existence or

meaning, as the captain shouts to the crew to keep them awake. A condition without a name lacks the redundancy of being named. This scene is followed by the scientist musing aloud about how new things can be discovered in the universe, if everything already is known (i.e., has been named). The captain demands to know the probability of whether the crew will wake up after it passes the dark star — whereas we the audience wonder whether we will redundantly fall asleep as every character in the film takes a long time to fall asleep — the scientist has calculated that they will all sleep for 60 hours, which is indeed how long this extended sleeping scene feels to unfold for the audience, as we are subject to wave after wave of narcoleptic attack on human systems.

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The chief scientist notes upon waking that there are no coincidences in the universe. Redundancy is always a signal for meaning.

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Ikarie XB 1 appears to be self-consciously reflexive of its having produced a unclimactic climax, and so gives us a second climax in the form of a deranged Michael wandering the ship's halls with a laser blaster while trying to find a pod capsule back to Earth (which he also shouts no longer exists, being confused by the Dark Star radiation, since he had received a more direct exposure to it on the space walk).

So the film, in its general spirit of informational redundancy, gives us two climaxes: in the first climax, the whole crew falls asleep due to dark star radiation, and in the second climax, a deranged Michael runs around the corridors with a blaster shooting at things. A polarity of possibilities for climaxes is rendered in the narrative — anti-action and action, like the 1s and 0s of digital loops.

Michael's first act of violence is to destroy his smartwatch, called a "transmitter" in the film as mentioned above, because it affords a form of redundant surveillance (remember the hallways are already riddled with spying eye glow spheres). His second violent act is shooting through the door at Patrick who is trying to robotorch it open, which "kills" the robot. He subsequently shoots at various video eyes, which reduces his communicative interactions with the crew to a general sound-only channel, since it appears he cannot also shoot audio speakers (audio appear to be unshootable). When Michael blasts a video sphere, his crewmate looking into the distant monitor that receives the video feed squints his eyes in pain, so an overload on the video signal chains can also overload onlooking eyeballs.

What is the probability that a madman (who has just been infected or affected by Dark Star radiation) will come across a handy blaster just set there in the open, resting upon a hallway podium? Even in the 19th century, muskets would be kept inside living room cabinets, but on the Ikarie they can be found in a hallway resting on a stand, waiting for anyone to grab at them. Also, why do the other Ikarinauts not have blasters? There appears to be only one blaster on the ship, in one remote corridor, sitting on a pedestal, essentially a *deus ex machina*.

Ikarie XB 1 – The radiation-deranged Michael easily finds the ship's only blaster.

The madman with a blaster shoots out the video cameras so that the rest of the crew cannot track his whereabouts as he rampages through the ship looking for a way back to Earth, which he screams never existed. However it doesn't occur to him to also shoot out the audio speakers! This is the fabula of film — as set design props, video cameras are distinct and identifiable objects that jut out from the bulwarks, but audio speakers apparently are embedded into the matrix of the ship's hull, and so cannot be used for blaster target practice. This gives us the auditory-narratological premise of continuing the crew's vocally broadcast dialogue with the rampaging hallucinatory blaster-blasting madman. In films and spaceships as in real life, you can turn off the lights in the room but not the sound of the room. This voice of the ship's captain without the accompanying video feed does not quite conform to Michel Chion's concept of the acousmêtre:

> Acousmêtre — a kind of voice-character specific to cinema that derives mysterious powers from being heard and not seen. The disembodied voice seems to come from everywhere and therefore to have no clearly defined limits to its power.
>
> Acousmêtre depends for its effects on delaying the fusion of sound and image to the extreme, by supplying the sound — almost av voice — and withholding the image of the sound's true source until nearly the very end of the film. Only then, when the audience has used its imagination to the fullest is the real identity of the sound revealed, almost always with an accompanying loss of imagined power. As long as we can't see whom we attribute all-seeing power to the voice, but once inscribed in the visual field he loses his aura (as the wizard in the *Wizard of Oz*, 1939, and HAL in *2001*).[014]

014   *Acousmêtre*. Available online: http://filmsound.org/chion/metre.htm, [accessed 24/6/2016].

Another good example of an acousmêtre would be Charlie in *Charlie's Angels* (2000), who exists purely as an authoritative tabletop speaker phone. The HAL 9000 of *2001* is also an acousmêtre, while the AI of *Ikarie XB 1* is constantly deprived of the power of HAL, because its algorithms regularly crank out dumb speech. HAL of course fits the paradigm of losing "his" vocal power just like the Wizard of Oz, becoming dumber as the silicon brick memory banks are pulled out, which is an equivalent to pulling back the curtain which hides the short Wizard fellow. Film theory appears to be in need of a modified acousmêtre, to account for all those instances of deflated acoustic power and presence that should pertain to the auditised-only voice but where this mediated voice is imbued by narratological devices with deflationary power effects. We can provisionally call this (to add a new word to the lexicon) the *audio deflatio*.

Thus the blaster-on-a-fortunate-pedestal is not just a probability-busting *deus ex machina*, but a cipher of the *audio deflatio*, which reveals the power of sound to outlast blasted-out video cameras, but this outlasting is also a mere persisting, because without an image there is no target practice, and thus nothing to hit, which robs the blaster-bearer of desired power because he cannot shoot out the sound like he can shoot out an image. Likewise, the PA system which carries the vocal messages of the crew is useless because the intended recipient of the message is insane, lacking the metacommunicative capacity to hold a conversation with others, and lacking the metalinguistic capacity to know what he is talking about. A metaperceptual incapacity lies in the ability to shoot out video cameras but which leaves the audio system intact. In any event, Michael's rampage through the corridors (he is seeking Earth, which he cannot see, and turning off robots which threatens the crew's survival) is a soundtrack opportunity for ramping up the acoustic redundancies – Anthony's voice (through the PA system) echoes in a crescendo of feedback loops on top of the already dense accumulation of electronic arpeggios.

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There were two Ikarinauts who had gone out on a spacewalk to make a repair, and so two exposed to the direct radiation of the dark star. One rampages with a blaster (Michael), the other is in a medical recovery unit. Like the two astronauts killed on the derelict ship, the two spacesuits of the inflicted Ikarinauts are seen in a quarantine closet, rotting away in a charred humanoid space mass, exactly and redundantly two of them.

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A baby cries in the spaceship, because a pregnant crewwoman has been allowed on board. Baby sound is projected throughout the Ikarie's corridors via the audio transmission ≈ system of invisible speakers. Thus *Ikarie XB 1* confuses its own premise as to whether this is a retelling of the Adam and Eve story or the story of Icarus and his Wing Dad. The Greek myth of the title becomes a Hebraic myth with a baby born of exiled humanity wandering the cosmos in search of not quite the land

of milk and honey but at least a habitable planet. The baby's voice is broadcast and disembodied and echoed and reverbed throughout the whole ship. The baby's cries make the Ikarie's hulls resonate with baby frequencies. This journey of the Ikarie with a baby at its ending perhaps presages Kubrick's Bowman-cum-Star Child figure, only in a much less confusing manner plot-wise. The baby is at least the second overt and redundant reference to birth (remember the Listless Birthday Dance).

Previously there was a reference to a "ship in a bottle", as in the idea of sending Earth back a message in a capsule before entering the dark star's narcoleptic zone. This image returns as they near the planet orbiting Alpha Centauri, the denizens of which have created a force field to protect the ship from excessive Dark Star radiation, a forcefield envelope also "like a ship in a bottle". These repeating references of course reference the trope in the audience's general cultural knowledge. Thus producing more order in the universe.

Ikarie XB 1 plays a sophisticated game with its audience, taking up key ideas as in cybernetics, such as control loops, artificial intelligence, redundancy, entropy, the nature of information and communication, and integrating these into its aesthetic universe. As the *Ikarie* enters the atmosphere of the White Planet, the score sounds like very traditional film music, with harmonies full of impending closure, allowing a few strains of radio frequency noises to infiltrate at the end, as a final nod to the electronic sound palette.

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Coda:

The film *Particle Fever* documents the contemporary discovery of the Higgs Boson. The great drama that plays out is between the two main competitor theories that predict the boson's mass, Supersymmetry and the Multiverse. Supersymmetry posits a set of as-yet-undetected elementary particles complementary to the currently known ones, while Multiverse posits a much more encompassing reality that is in its essence chaos and noise, and in the context of which our universe's cosmological constant, which appears to give great order, structure and stability to everything in and of our universe, is but one random possible value in a frothing foam of other universes each of which would have different laws of physics because they would have differing constants, so that in each universe the laws that produce order are themselves the results of pure chance and chaos at the scale of the Multiverse.

In short, the two competing theories for the origin of the universe — both of which had predictions for the mass of the Higgs boson — had wildly different conceptions of the fundamental dynamics of nature — one highly ordered, the other highly disordered or random. Supersymmetry predicted a mass of ≈115 GeV while the Multiverse predicted a mass of ≈140 GeV. The actual detected mass was ≈125 GeV or approximately halfway between the two predicted masses of the competitor theories. It should not surprise us to find out that the most fundamentally knowable basis of our entire universe is neither completely ordered nor completely chaot-

ic. Rather, one possibility is that it is "between" order and chaos and perhaps in a manner like language itself, which information theory posits as 50% redundant. In other words, neither fully ordered nor fully random, but dynamically in between these two polar probabilities.

This leads to a further thought — what if the fundamental organisation of the universe were a lot like language, or in other words, *meaning*. This is not to anthropomorphise human meaning all the way down to the quantum level at Big Bang energies, but rather to posit instead that the same kinds of systemic function-structures (functional structures or structured functions — in short, organisation) plays out at all system levels from quanta to language. In other words, the system of language as a dynamic play of order and chaos appears at a completely different scale — that of the Higgs Boson— such that language embodies this same character of organisation that is neither wholly chaotic and random, nor completely ordered and structured, but approximately halfway between. Whatever meaning is, what if it were systemically of the same dynamics as the rest of the universe in its organisational principles, cascading up the levels of nested systems into the emergent phenomena of our embodied neural networks?

Ultimately the value of the serious intellectual games played by speculative art such as *Ikarie XB 1* is to provoke such cosmic ideas, without necessarily pretending to know the answers to its provocations. The Ikarie craft explores a universe replete with redundancies, neither coincidental noise nor clocklike in its repetitions. Its filmic language mirrors the 50% redundancy rate of general language. Redundancies do not foreclose the appearance of the new, whether new babies or new Dark Star phenomena. As Bateson conjectured, "All that is not information, not redundancy, not form and not restraints — is noise, the only possible source of new patterns."[015]

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015   G. Bateson, op. cit., p. 418.