



GOLDILOCKS ZONE OF CONSCIOUSNESS

OPPORTUNITY FOR INTELLIGENT LIFE
MORE THAN JUST LOCATION

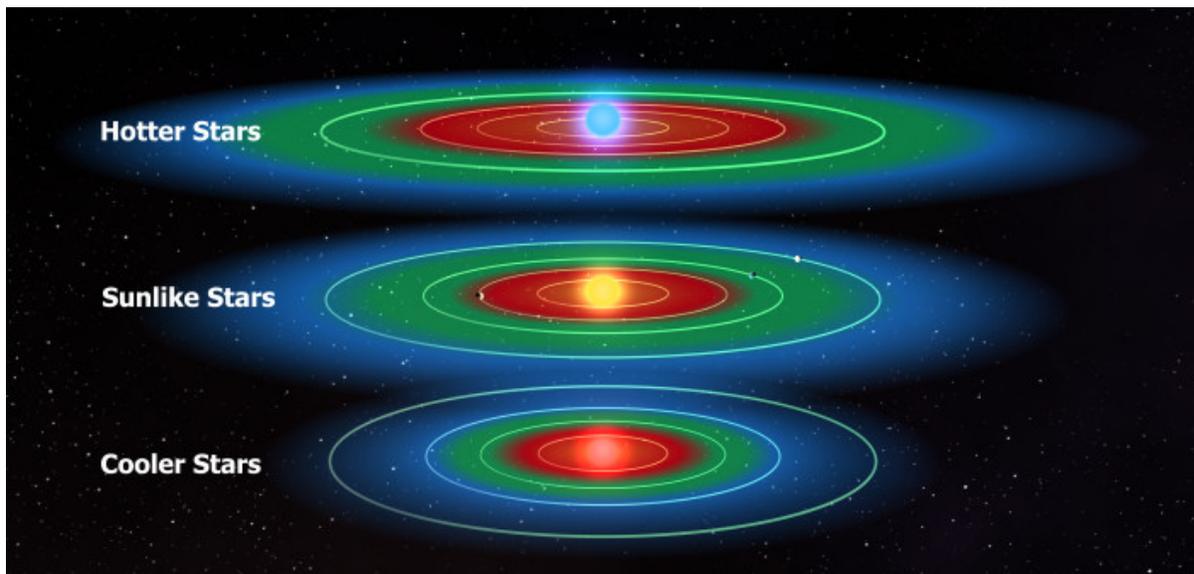


EVENTFUL
DEVELOPMENTS INC.

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It's long been known that Planet Earth occupies a special place in the universe. Certainly not at the center of it like old ways of thinking fiercely defended, but preferential real estate none the less; an exclusive location within our solar system ripe with the opportunity for intelligent life. Welcome to the *Goldilocks Zone*: the habitable region of a star that's not too hot and not too cold – the “just right” stellar environment where liquid water can exist at a planet's surface and life as we know it may flourish. You can think of this Goldilocks Zone – or *Habitable Zone* as it's technically referred to – as a temperate band of space surrounding a sun where the potential for life to emerge and develop is greatest, and depending on the intensity of its host star, the size and location of this territory will vary. Like a campfire that burns you at close range or will leave you in the cold if you're too far away, stars behave in a similar fashion offering a level of planetary comfort depending on how hot the fire is, and in the case of our own solar system Earth naturally occupies this prime position inside the orbit of frigid Mars and outside the track of broiling Venus.

THE IMAGE BELOW ILLUSTRATES STELLAR HABITABLE ZONES VARYING BY TEMPERATURE OF THE HOST STAR
THE RED BAND IS TOO HOT, THE BLUE ONE IS TOO COLD, AND THE GREEN BAND HIGHLIGHTS THE GOLDILOCKS ZONE



[Image Credit: NASA/Kepler Mission/Dana Berry]

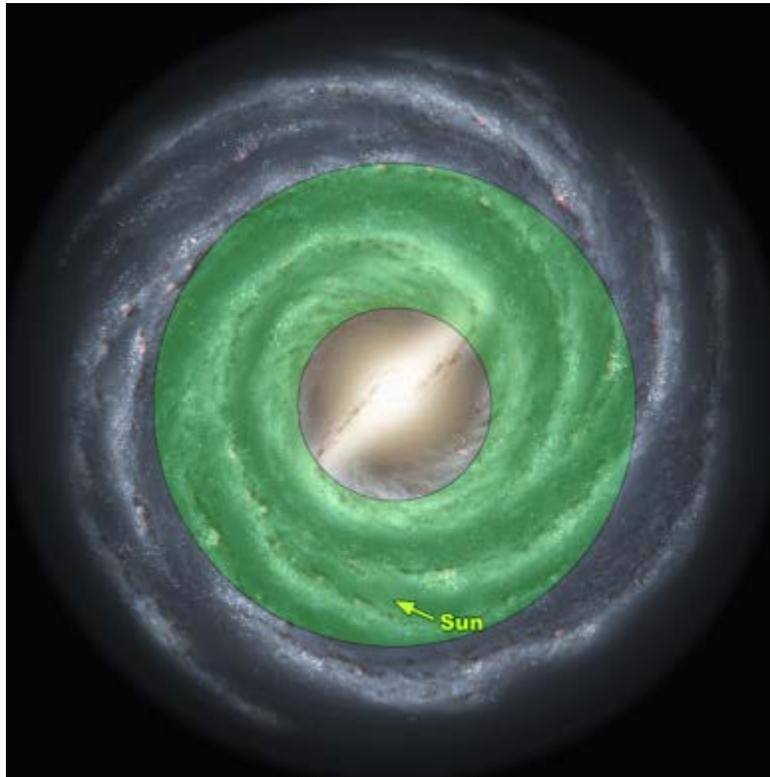
THE MIDDLE STAR (YELLOW) REPRESENTS TODAY'S SOLAR SYSTEM WITH EARTH OCCUPYING THIS EXCLUSIVE TERRITORY.
THE GOLDILOCKS ZONE OF THE COOLER RED STAR (BOTTOM) WOULD OFFER VENUS THE PREFERENTIAL LOCATION,
WHEREAS THE HABITABLE ZONE OF THE HOTTER BLUE STAR (TOP) PRESENTS MARS WITH GOLDILOCKS CONDITIONS

Revolving at a comfortable distance from the gigantic ball of blazing plasma we know as the Sun, this advantageous address has graced our world for billions of years with the right mix of light, heat and energy to create and sustain a laboratory of life. Our living planet

abounds with a staggering variety of biological existence, so the proof of this Goldilocks Zone appears to be in the pudding (or some might say porridge), but does this temperate turf preclude life from emerging elsewhere in the solar system? The answer to this question is currently shrouded in uncertainty, but it seems safe to say that the capacity of a planet or moon to produce brainy beings is contingent on the occupation of such exclusive real estate. Extraterrestrial organisms may well exist elsewhere within our Sun's incessant grip, perhaps under the ice-covered surface of Jupiter's satellite Europa where a liquid ocean is predicted to lurk; a candidate world and arguably the best place in the solar system to be considering at present. However, even if life does happen to reveal itself on another sphere in our neck of the woods, it will surely be simple in nature – not life forms like us capable of pondering the question. So, on at least one rocky world occupying the habitable zone of its parent star, life has emerged, evolved, expanded and persevered against all odds to produce a being with the capacity to probe the possibilities for alien existence.

What about the billions of stars in our galaxy with Goldilocks Zones of their own? Surely many of them must have terrestrial worlds orbiting at the right distance for life to get a foothold and begin the long march of evolution towards the kind of complexity we see here on Earth. The hunt is on and results are proving planetary systems to be a natural feature of star formation as long predicted. Astronomers to date have found hundreds of exoplanets orbiting distant stars in the Milky Way with some occupying the habitable region of their sun. This is an exciting time to be alive indeed as it appears only a matter of time and technology before we discover that Earth-life is not acting alone on the universal stage, and so the question of course becomes, how rare is intelligent life in the Milky Way? An inquiry that has been deliberated for decades as well resulting in many a debate and spawning speculative hypotheses like the Drake Equation, which probabilistically predicts our galaxy should be host to many intelligent civilizations, and in turn the Fermi Paradox which says: "OK, but where are all the aliens?" and goes on to postulate why we've detected nothing; not a peep, not a single suggestive signal or electronic echo emanating from the galactic wilderness we find ourselves in. At the end of the day, the case is not clear, so the jury is hung, and considering the perceived lack of communication coming from an elusive E.T., we engage the next layer of livability in our universe – the habitable zone of a galaxy which is far more conjectural than its solar system counterpart.

THE PROPOSED HABITABLE ZONE OF THE MILKY WAY



[Image Credit: Wikimedia Commons; NASA]

THE GREEN BAND HERE REPRESENTS A HYPOTHETICAL REGION WHERE LIFE IS MOST LIKELY TO DEVELOP – A LOCATION NOT TOO CLOSE TO AN OVER-POPULATED AND HAZARDOUS CORE, AND NOT SO FAR OUT WHERE THE MIX OF MATTER ISN'T METAL-RICH ENOUGH TO CREATE TERRESTRIAL WORLDS.

On this galactic playing field of possibility where we ponder the probability for life to emerge, evolve, endure and escalate to higher intelligence – planets revolving stars is elementary, whereas worlds orbiting galaxies is anything but. On the one hand, it's quite simple to surmise in the clockwork mechanics of a mature solar system where the best niches for living organisms should exist, however on the other hand where we open our perspective up to this entire star system, the limits on lasting life are rather unpredictable. That's because our Milky Way is a monstrous beehive of stellar activity where over a hundred billion stars progress through their life cycles as they orbit the galactic core at incredible speeds. Our Sun for instance circumnavigates the galaxy at a breakneck pace of 225 kilometers per second carrying all of us along with it; fast enough to go around Earth's equator in less than 3 minutes, yet still takes about 240 million years to complete a single revolution. Make no mistake about it, this island universe humans call home is enormous and trying to cross it from one edge to the other at the speed of light (1,300 times faster than our Sun is moving) would take close to 100,000 years! And don't let its name fool you

either as the Milky Way's spacescape is by no means homogeneous making it difficult to determine exactly where the mix is just right for advancing life.

Imagining ourselves traversing the Milky Way from the outside in, we begin in the spheroidal halo – the back country of our gargantuan galaxy where globular clusters of ancient suns orbit the central hub at great distances. The formation of new solar systems does not occur in these sparsely populated parts and any newcomers that do happen to arrive are considered outsiders; stellar immigrants from passing dwarf galaxies that the Milky Way periodically devours. Leaving the sticks and heading inward, we cross the boundary to the galactic disk where our galaxy assumes its familiar shape and stars nearly as old as the universe tell stories of epochs gone by. Travelling from rural to urban we go, passing through the outer edge of the Perseus Arm where the scenery shifts and stellar populations increase; the entrance to a spiraling suburbia filled with molecular clouds that are busy giving birth to the next generation of suns. Within a bedroom community like this one is where our own star and its siblings were born long ago and cutting through this section of the suburban sprawl, some of the most stunning astronomical attractions are witnessed in the form of star clusters, planetary nebulae, stellar nurseries, and supernova remnants that dot the spacescape. Halfway home we encounter a celestial clearing – the inner rim of the Orion Arm where the very star that gave us life passes by in a hurry to complete another galactic orbit. Now a mere 27,000 light years away from the bustling hub that beckons our arrival, we push through another stretch of spiraling suburbs to reach the interior of this stupendous star system. The bright lights and big city bulge created by a dense population of stars, many of which come together in elongated bars. This is a dangerous place to visit where crowds of stellar inhabitants race around an energetic downtown core – a swirling sphere of suns encircling a supermassive black hole that forms the heart of our galactic metropolis. In the space between this crowded core full of hazards and remote rural regions where matter is too sparse to concoct the chemistry of life, we find ourselves nestled in a peaceful pocket – this quiet little neighborhood within the proposed habitable zone of our galaxy where life has endured on a terrestrial world for almost four billion years. Sixteen revolutions deep in the subsistence of living organisms and more than two of those trips around the galaxy supporting life on land, surely, we are the beneficiaries of Goldilocks conditions in the Galactic¹. However short we are right now on gratitude, we are conversely long on luck as our place in this cosmic crapshoot remains a land of opportunity where the clear and present danger is by human hands alone. At the right distance from the Sun and settled securely within the cradle of the galaxy, we move

on to the final layer of livability in the cosmos; one not at all concerned with location and less to do with sustainability, our perspective shifts to the habitable zone of the universe itself where it's more about timing.

**ALTHOUGH OUR UNIVERSE MAY BE ON ITS
WAY TO INFINITY IN BOTH TIME AND SPACE,
IT IS BY NO MEANS INFINITE IN POTENTIAL**

So here we are, intelligent beings living on a rocky planet, orbiting a dependable star, circling a spiral galaxy that's one among billions within a vast universe. A place where you exist today because of what came before, and on that lengthy list of being before your becoming it's obvious our universe itself was the start of it all – the primary layer of creation that hasn't always and won't forever create the opportunity for life. From big bang birth to a panoramic platform of galaxies, stars, planets and on this one people, a stunning spectacle in space and time presents the here and now. Just right for life, not only do we find ourselves in the warm embrace of our Sun tucked inside the beneficent bosom of our galaxy, we exist within the habitable zone of a higher order when all is super-seeded by this star filled age – a distinct period in the continuance of our cosmos where you, me and everything we see is made possible by the Stellar Flow.² And in the middle of this main sequence burns a deeper truth; that although our universe may be on its way to infinity in both time and space, it is by no means infinite in potential. After all, it's written in the stars that the capacity for creation is forever finite and when we look at our home in the heavens – within this Goldilocks Zone of Consciousness we altogether occupy – one should feel a deep sense of belonging amidst the realization that we are here and now because the now is dear. Gratitude is quite simply a grateful attitude, so the next time you raise your eyes towards those heavenly bodies that impermanently light up the dark, I hope you'll take a moment to appreciate your special place among them and perhaps it will dawn on you that just like the universe, it's our opportunity to shine.



Reference:

¹ As the fourth current of the Universal Flow: *The Galactic* encompasses the lives of individual galaxies themselves along with their existence together as a dynamic and evolving whole. A web of relationship in galactic proportion that stretches across a vast material realm where the force of

gravity continually shapes the cosmic scene – see *The Universal Flow of Consciousness & Existence*; page 41

² We are nothing without the stars. Literally. You, me and everything we see is a product of the *Stellar Flow* – this generational progression of the stars (birth-life-death cycle) that created almost every naturally occurring element in the universe and in turn the Earth and all life that exists upon it. In the reality of our cosmos, we are all essentially star dust – see *The Universal Flow of Consciousness & Existence*; page 47

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