

Big History and SETI 2023

Report of Contributions

Contribution ID: 1

Type: **Oral presentation**

Astrobiology: Resolution of the Statistical Drake Equation by Maccone's Lognormal Method in 50 Steps

We use the mathematical tool of Maccone's lognormal distribution to further factor the Drake equation, which calculates the number of advanced civilizations in the galaxy, from the seven original levels of the Drake equation to 49 levels of overall analysis. The Maccone approach, in fact, supported by the central limit theorem, becomes more reliable the more levels are introduced. The resulting study necessarily draws upon an array of disciplines ranging from astronomy, chemistry and geology to biology, paleontology and futurology. The result calculates the number of planetary systems suitable for life in its various stages of development: those which have probably hosted life in the past and those which still host it at its various evolutionary levels. The final evolutionary level is the so-called galactic civilization (often called ETC, or Extra Terrestrial Civilizations). The number of resulting galactic civilizations is divided between static civilizations, which do not move around the galaxy and whose Kardashev rating is still low (less than 1.4), of which we find three examples (we ourselves plus, perhaps, two others), and potentially dynamic civilizations, which move around the galaxy and have a sufficiently high Kardashev rating (equal to or greater than 1.4), of which we find 2,000.

Title

THE LIVING GALAXY: 50 shades of the Drake equation through the lognormal of Claudio Maccone

Author name

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Track

SETI, English

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Presenter: Dr MIELI, Eugenio

Session Classification: Big History and SETI in English

Contribution ID: 3

Type: **Oral presentation**

Il SETI in Italia: Una Storia Ancora da Scrivere

L'Italia è stata uno dei paesi maggiormente coinvolti nelle ricerche SETI fin dagli albori di tale programma di ricerca; ricercatori e scienziati afferenti a istituzioni scientifiche come l'Istituto Nazionale di Astrofisica hanno contribuito significativamente alla ricerca internazionale. Tuttavia, non esiste ancora alcuno studio compiuto che tracci la storia dei progetti SETI condotti in Italia. Nel corso di questa presentazione, verrà delineato un progetto per scrivere tale storia, concentrandosi sulla formulazione dei quesiti di ricerca. In particolare, verranno trattati gli aspetti metodologici inerenti alla ricerca delle fonti necessarie a una ricostruzione storica della diffusione in ambito italiano di tematiche scientifiche come la ricerca di intelligenza extraterrestre e di tecnologie come la radioastronomia. Attenzione particolare verrà dedicata a quei campi in cui la ricerca italiana ha apportato contributi particolarmente significativi o innovativi riguardo a specifici aspetti delle ricerche SETI.

Title

Il SETI in Italia: Una Storia Ancora da Scrivere

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Contribution type

Track

SETI, italiano

Primary author: DE PICCOLI, Lorenzo**Presenter:** DE PICCOLI, Lorenzo**Session Classification:** Big History and SETI in English

Contribution ID: 4

Type: **Oral presentation**

On the Wormhole-Warp Drive Correspondence

We propose a correspondence between the Morris-Thorne wormhole metric and a warp drive metric, which generalizes an earlier result by H. Ellis regarding the Schwarzschild black hole metric and makes it possible to embed a warp drive in a wormhole background. We demonstrate that in order to do that, one needs to generalize the Natario–Alcubierre definition of warp drive and introduce nonzero intrinsic curvature. We also analyze the energy requirements for this new type of metric and suggest that it could make it possible to bypass or alleviate the null energy condition violations found in Natario–type models.

Title

On the Wormhole-Warp Drive Correspondence

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SETI, English

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Session Classification: Big History and SETI in English

Contribution ID: 5

Type: **Oral presentation**

Solitude or cosmic multitude in the Fermi Paradox and a complex approach to the Great Silence

Many explanations have tried to resolve the Fermi Paradox, some of which have argued for our cosmic solitude. The more sceptical positions emphasise the innumerable random factors in the emergence of living species, the contingent events that may determine their extinction, the rare conditions of our solar system or our planet. On the other hand, some scholars have argued the abundance of life in the cosmos, it necessarily emerges as a result of physical and chemical laws, there is nothing special about our position as observers. Opposing sides emerge in which contingency and necessity become the metaphysical categories of reference, life is alternately represented as rare or extremely common. After identifying and researching the reasons for this polarisation in scientists' explanations, we will deconstruct the dualistic thinking behind these considerations. Philosopher Edgar Morin's complexity paradigm will help find an alternative that aims to articulate a multidimensional face of living systems and our knowledge. Previous solutions to the Fermi Paradox will be reconsidered in the light of complex thinking, which favours hypotheses that seek to interconnect the innumerable factors that have until now determined the Great Silence the universe.

Title

Solitude or cosmic multitude in the Fermi Paradox and a complex approach to the Great Silence

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Session Classification: Big History and SETI in English

Contribution ID: 7

Type: **Oral presentation**

TEMNO: Rilevamento e discriminazione di segnali astronomici transitori attraverso osservatori nanosatellitari

Descriviamo il concetto di TEMNO - Transient Event Multimessenger Nanosat Observatory - un osservatorio spaziale compatto per l'astronomia degli eventi transitori. Sebbene sia piccolo ed economico, TEMNO offre una rilevazione wFoV efficace e scalabile, cueing e analisi di un'ampia gamma di segnali astronomici transitori - Gamma Ray Bursts (GRB), Fast Radio Bursts (FRBs), Supernovae (Sn). Questi eventi sono energetici, transitori e distribuiti in modo isotropo sulla sfera celeste, il che li rende ottimi strumenti per studiare la storia profonda del nostro universo e relativamente difficili da studiare con i mezzi tradizionali. L'architettura proposta, che prevede un segmento spaziale modulare abbinato a una stazione di terra, consente il monitoraggio continuo del cielo, l'analisi dei segnali ricevuti e il cueing dei sensori esistenti, inserendosi perfettamente nei punti ciechi delle strumentazioni esistenti, come INTEGRAL. Il segmento spaziale del sistema proposto si basa su nanosat compatti (6U) costruiti per la maggior parte con componenti commerciali, off-the-shelf, per consentire il monitoraggio continuo wFoV del cielo per le emissioni di raggi gamma, ultravioletti e radio. Inoltre, sottolineiamo l'efficacia di un approccio di monitoraggio costante a basso costo basato sui Big Data per campi di interesse basati sulla ricerca di segnali brevi e transitori, come il SETI.

Title

TEMNO: Rilevamento e discriminazione di segnali astronomici transitori attraverso osservatori nanosatellitari

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Big History, italiano

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Session Classification: Big History and SETI in English

Contribution ID: 8

Type: **Oral presentation**

Big History in Italy

Throughout history, different cultures have sought to weave a coherent tapestry of the universe and its evolution, driven by an innate curiosity about its origins. These narratives not only shaped cultural identities but often served as tools for asserting dominance. In the modern era, scientific endeavours took a pivotal turn with the discovery of cosmic background radiation in 1964, culminating in the emergence of the Big History narrative by the turn of the millennium.

In the Italian context, this cosmic perspective, widely popularized by media, found profound exploration through the research conducted at the Coldigioco Geological Observatory and at the OPPI. This communication primarily delves into the educational initiatives spearheaded by the OPPI, while acknowledging the influence of the International Big History Association and the European Big History Network.

The Big History vision has found significant studies and experiences in Italy. These have recently been summarised in a monograph that will be presented during the communication.

Title

Big History in Italy

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Contribution type

Oral presentation

Track

Big History, English

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Session Classification: Big History and SETI in English