

DUT CMB Scientific Engine 3.0 - Mission-Grade Cosmological Inference Software for Open Scientific Research

Open, mission-grade software enabling transparent cosmological inference from CMB, supernovae, and large-scale structure data—no black boxes, no ad hoc fixes.

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EINPresswire.com/ -- [ExtractoDAO Labs](#) today announces the release of [DUT CMB Scientific Engine 3.0](#), a mission-grade cosmological inference software engineered to operate as open scientific infrastructure for universities, research institutes, and independent researchers worldwide.

Designed under production-level numerical controls, full physical transparency, and strict reproducibility requirements, DUT CMB Scientific Engine 3.0 represents a decisive step beyond black-box cosmology pipelines and ad hoc modeling strategies that increasingly fail to interpret the depth and complexity of modern astronomical observations.

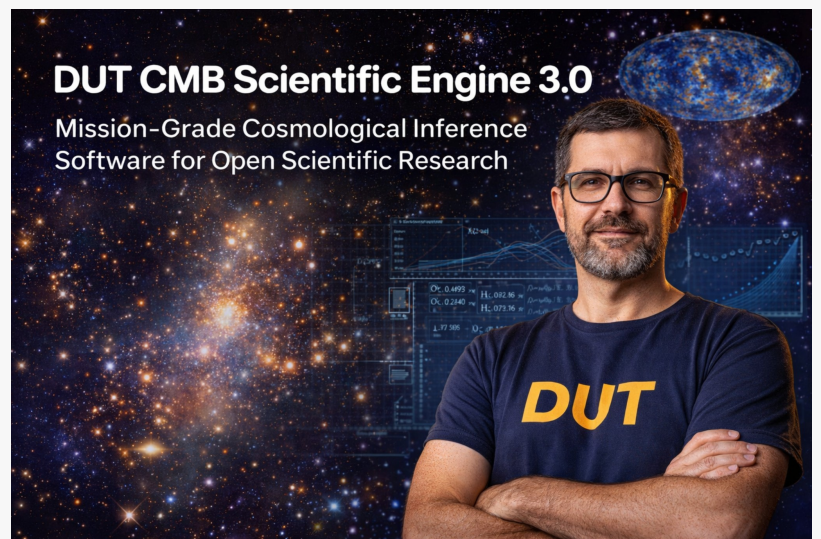
“For years, the limiting factor in cosmology has not been the quality of the telescopes, but the quality of the interpretative software,”

says Joel Almeida, Software Engineer and Founder of ExtractoDAO Labs.

“DUT CMB was built as infrastructure, not as a shortcut. Every equation is exposed, every assumption is traceable, and every result can be independently verified. That is the minimum standard modern science requires.”

A generational turning point in cosmology

Across universities and research centers, a new generation of cosmologists is entering the field at a moment of conceptual transition. While instruments such as JWST, DESI, Euclid, and Roman deliver unprecedented data quality, many early-career researchers express growing



Conceptual illustration of a researcher using the DUT CMB Scientific Engine 3.0 to interpret deep-universe data through transparent, mission-grade cosmological inference.



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*Eduardo Rodrigues, CFO,
ExtractoDAO Labs*

dissatisfaction with Λ CDM-centric pipelines that rely on parameter patching, phenomenological extensions, or opaque inference layers.

DUT CMB Scientific Engine 3.0 was designed to meet this moment.

Rather than forcing observations to conform to predefined assumptions, the engine functions as an open research laboratory, enabling researchers and students to test, falsify, and refine cosmological hypotheses within

established physical equations, not ad hoc statistical constructs.

“Students today are aware that parts of what they are studying may be rewritten in front of them,”

Almeida adds.

“This software gives them a controlled, rigorous environment to explore that transition responsibly.”

From black boxes to open laboratories

Unlike most existing cosmology frameworks, DUT CMB exposes the entire computational chain:

background evolution,

scalar-tensor dynamics,

distance calculations,

likelihood construction,

numerical health diagnostics and recovery.

Link software: <https://zenodo.org/records/17752029>

There are no proprietary solvers, hidden priors, or undocumented approximations. The system is designed so that any university, anywhere, can reproduce results line by line.

“Transparency is not a philosophical choice — it is an engineering requirement,” says Robson Miranda, CTO of ExtractoDAO Labs.

“When numerical stability, caching, and validation are treated as first-class citizens, scientific confidence follows naturally.”

A sustainable deep-tech model for open science

DUT CMB Scientific Engine 3.0 is developed by ExtractoDAO Labs, a deep-tech startup operating at the intersection of computational physics, scientific software engineering, and decentralized research infrastructure.

The engine is fully open and free for academic and research use, while long-term sustainability is pursued through institutional partnerships, advanced simulation services, and collaborative research programs — not through closed licenses or restricted access.

“Open scientific infrastructure can be sustainable without becoming opaque,” says Eduardo Rodrigues, Chief Financial Officer of ExtractoDAO Labs.

“Our model is built to align financial responsibility with scientific openness, ensuring that universities and researchers are never locked out of the tools they depend on.”

Facing deep-universe discoveries without ad hoc fixes

As modern astronomy explores deeper redshifts and uncovers structures once thought incompatible with standard assumptions, the challenge is no longer data scarcity — but interpretative rigor.

DUT CMB Scientific Engine 3.0 does not promise simplified answers or cosmetic resolutions. Instead, it provides the computational discipline and physical consistency required to confront unexpected observations directly, without introducing unmotivated parameters or black-box corrections.

“The universe is not becoming incoherent,” Almeida concludes.

“Our tools are simply evolving to finally match its complexity.”

Availability

DUT CMB Scientific Engine 3.0 is available immediately and free for universities and researchers worldwide.

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