

# The Cantata Network Unveils Exciting Developments!

## An Inside Look at Cantata's Latest Progress and Upcoming Initiatives

### MODIFIED GRAVITY AND COSMOLOGY: An Update by the CANTATA Network

Emmanuel N. Saridakis<sup>1,2,3</sup>, Ruth Lazkoz<sup>4</sup>, Vincenzo Salzano<sup>5</sup>, Paulo Vargas Moniz<sup>6,7</sup>, Salvatore Capozziello<sup>8,9,10</sup>, Jose Beltrán Jiménez<sup>11</sup>, Mariafelicia De Laurentis<sup>12,8,10</sup>, Gonzalo J. Olmo<sup>13,14</sup> (Editors)

Yashar Akrami<sup>15,16</sup>, Sebastian Bahamonde<sup>17,18</sup>, Jose Luis Blázquez-Salcedo<sup>19</sup>, Christian G. Böhrer<sup>18</sup>, Camille Bonvin<sup>20</sup>, Mariam Bouhmadi-López<sup>21,1</sup>, Philippe Brax<sup>22</sup>, Gianluca Calcagni<sup>23</sup>, Roberto Casadio<sup>24,25</sup>, Jose A. R. Cembranos<sup>19</sup>, Álvaro de la Cruz-Dombriz<sup>26</sup>, Anne-Christine Davis<sup>7</sup>, Adrià Delhom<sup>13</sup>, Eleonora Di Valentino<sup>27</sup>, Konstantinos F. Dialektopoulos<sup>28</sup>, Benjamin Elder<sup>29,30</sup>, Jose Maria Ezquiaga<sup>31</sup>, Noemi Frusciante<sup>32</sup>, Remo Garattini<sup>33,34</sup>, László Á. Gergely<sup>35</sup>, Andrea Giusti<sup>36</sup>, Lavinia Heisenberg<sup>37</sup>, Manuel Hohmann<sup>17</sup>, Damianos Iosifidis<sup>38</sup>, Lavrentios Kazantzidis<sup>39</sup>, Burkhard Kleihaus<sup>40</sup>, Tomi S. Koivisto<sup>17,41,42,43</sup>, Jutta Kunz<sup>40</sup>, Francisco S. N. Lobo<sup>42</sup>, Matteo Martinelli<sup>44,45</sup>, Prado Martín-Moruno<sup>19</sup>, José Pedro Mimoso<sup>42</sup>, David F. Mota<sup>46</sup>, Simone Peirone<sup>44</sup>, Leandros Perivolaropoulos<sup>39</sup>, Valeria Pettorino<sup>47</sup>, Christian Pfeifer<sup>17</sup>, Lorenzo Pizzuti<sup>48</sup>, Diego Rubiera-García<sup>19</sup>, Jackson Levi Said<sup>49,50</sup>, Mairi Sakellariadou<sup>51</sup>, Ippocratis D. Saltas<sup>52</sup>, Alessio Spurio Mancini<sup>53</sup>, Nicoleta Voicu<sup>54</sup>, Aneta Wojnar<sup>17</sup> (Section Contributors)

#### Abstract

General Relativity and the  $\Lambda$ CDM framework are currently the standard lore and constitute the concordance paradigm. Nevertheless, long-standing open theoretical issues, as well as possible new observational ones arising from the explosive development of cosmology the last two decades, offer the motivation and lead a large amount of research to be devoted in constructing various extensions and modifications.

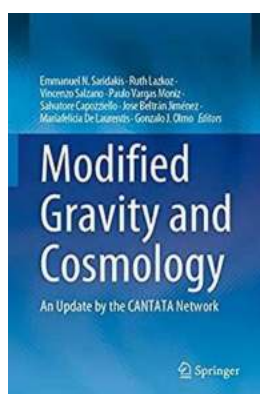
All extended theories and scenarios are first examined under the light of theoretical consistency, and then are applied to various geometrical backgrounds, such as the cosmological and the spherical symmetric ones. Their predictions at both the background and perturbation levels, and concerning cosmology at early, intermediate and late times, are then confronted with the huge amount of observational data that astrophysics and cosmology are able to offer recently. Theories, scenarios and models that successfully and efficiently pass the above steps are classified as viable and are candidates for the description of Nature.

We list the recent developments in the fields of gravity and cosmology, presenting the state of the art, highlighting the open problems, and outlining the directions of future research. Its realization is performed in the framework of the COST European Action "Cosmology and Astrophysics Network for Theoretical Advances and Training Actions".

Welcome to Cantata Network's latest update, where we share the most thrilling developments in our mission to revolutionize the music industry!

## The Cantata Network: Connecting Music and Communities

For those unfamiliar with Cantata Network, we are a global hub dedicated to bridging the gap between talented musicians, passionate music lovers, and the communities that thrive on their collaboration. We aim to create a seamless platform that facilitates music creation, discovery, and sharing, all while fostering a vibrant community of artists and fans alike.



### Modified Gravity and Cosmology: An Update by the CANTATA Network by Massimo Mugnai (Kindle Edition)

★★★★★ 5 out of 5

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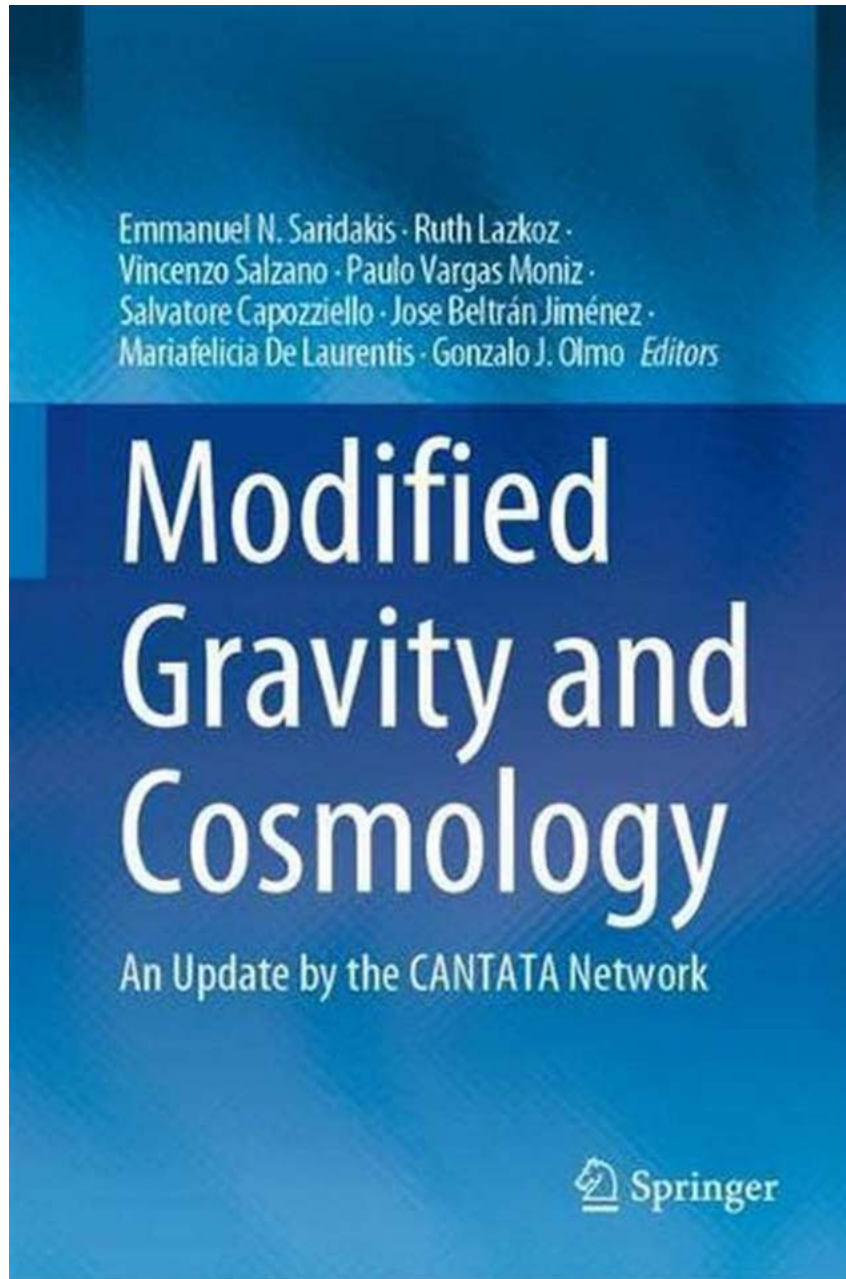
## Breaking News: A Game-Changing Feature!

We are thrilled to announce the release of our groundbreaking "Collaborative Playlists" feature, enhancing the way users interact with our platform! With Collaborative Playlists, you can now create and curate personalized playlists with your friends, family, and favorite artists, making music discovery a collective and enjoyable experience.

Imagine connecting with your musical heroes and being part of a carefully crafted playlist that brings together a multitude of genres and styles. Collaborative

Playlists are set to revolutionize how we consume music, ensuring a more personalized and immersive experience for all our users.

## **Upcoming Events: Cantata Concert Series**



We are excited to unveil our upcoming Cantata Concert Series, where we showcase the immense talents of our network's artists and bring unforgettable performances to music enthusiasts worldwide!

Through this series, we aim to support emerging artists, while also providing a platform for established musicians to showcase their creativity. So get ready to be captivated by mesmerizing melodies, electrifying performances, and thought-provoking collaborations that will redefine your perception of music!

## Spotlight on Cantata Artists

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General Relativity and the  $\Lambda$ CDM framework are currently the standard lore and constitute the concordance paradigm. Nevertheless, long-standing open theoretical issues, as well as possible new observational ones arising from the explosive development of cosmology the last two decades, offer the motivation and lead a large amount of research to be devoted in constructing various extensions and modifications.

All extended theories and scenarios are first examined under the light of theoretical consistency, and then are applied to various geometrical backgrounds, such as the cosmological and the spherical symmetric ones. Their predictions at both the background and perturbation levels, and concerning cosmology at early, intermediate and late times, are then confronted with the huge amount of observational data that astrophysics and cosmology are able to offer recently. Theories, scenarios and models that successfully and efficiently pass the above steps are classified as viable and are candidates for the description of Nature.

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arXiv:2105.12582v1 [gr-qc] 20 May 2021

As part of our commitment to empowering talented artists, we are delighted to introduce Cantata Artists, a dedicated program that spotlights exceptional musicians from around the world.

Whether you're an aspiring singer-songwriter, a virtuoso instrumentalist, or an innovative music producer, Cantata Artists offers you a unique opportunity to showcase your talent to a global audience. Through our platform, you can gain exposure, build your fanbase, and connect with professionals who can accelerate your music career.

### **Connecting Communities: Cantata Forums**

Our dedication to fostering a sense of community extends beyond music creation. Cantata Forums provide a virtual space for users to engage in meaningful discussions, share experiences, and discover like-minded individuals with a shared passion for music.

Whether you want to exchange ideas, seek advice, or simply connect with fellow music enthusiasts, Cantata Forums is the go-to place to establish meaningful connections with people from diverse backgrounds and experiences.

Emmanuel N. Saridakis · Ruth Lazkoz ·  
Vincenzo Salzano · Paulo Vargas Moniz ·  
Salvatore Capozziello · Jose Beltrán Jiménez ·  
Mariafelicia De Laurentis · Gonzalo J. Olmo *Editors*

# Modified Gravity and Cosmology

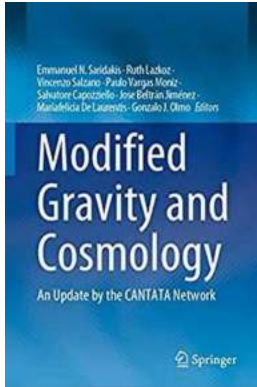
An Update by the CANTATA Network

 Springer

The Cantata Network is continuously evolving to provide an enriching music experience, connecting artists, fans, and communities on a global scale. With our revolutionary Collaborative Playlists feature, upcoming Cantata Concert Series, and dedicated Cantata Artists program, we are redefining how music is created, consumed, and celebrated.



Join us on this exciting journey by becoming a part of the Cantata Network today. Together, let's shape the future of the music industry and make extraordinary things happen!



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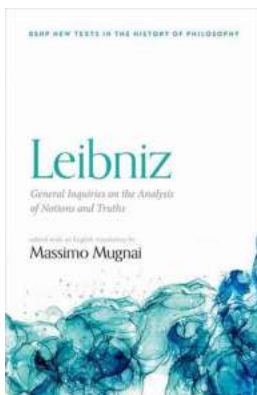
With a focus on modified gravity this book presents a review of the recent developments in the fields of gravity and cosmology, presenting the state of the art, high-lighting the open problems, and outlining the directions of future research.

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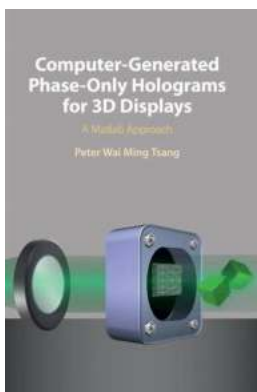
predictions at both the background and perturbation levels, and concerning cosmology at early, intermediate and late times, are then confronted with the huge amount of observational data that astrophysics and cosmology has been able to offer in the last two decades. Theories, scenarios and models that successfully and efficiently pass the above steps are classified as viable and are candidates for the description of Nature, allowing readers to get a clear overview of the state of the art and where the field of modified gravity is likely to go.

This work was performed in the framework of the COST European Action “Cosmology and Astrophysics Network for Theoretical Advances and Training Actions” - CANTATA.



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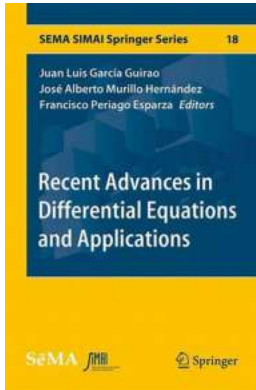
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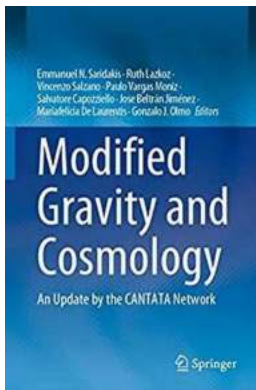
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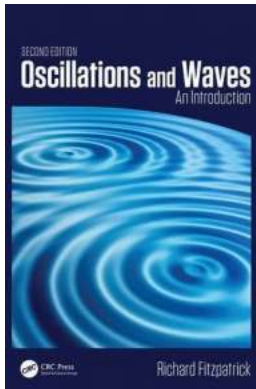
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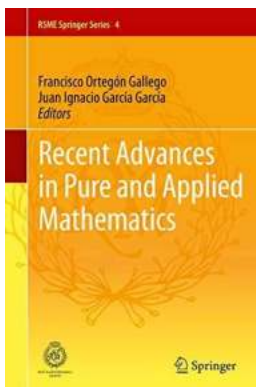
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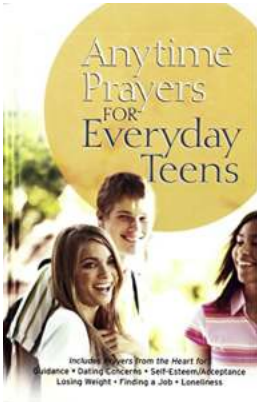
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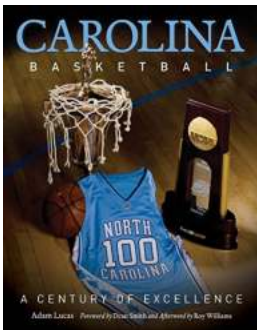
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