2nd Astro-COLIBRI multi-messenger astrophysics workshop

Rapport sur les contributions

https://indico.ijclab.in2p3.fr/e/9549

ID de Contribution: **1** Type: **Non spécifié**

MWL+MM emission of GRBs

lundi 20 novembre 2023 11:30 (30 minutes)

Orateur: GHIRLANDA, Giancarlo (INAF-Osservatorio di Brera)

Classification de Session: Introduction

ID de Contribution: **2** Type: **Non spécifié**

Multi-messenger transients

lundi 20 novembre 2023 10:30 (1 heure)

Orateur: BRANCHESI, Marica

Classification de Session: Introduction

ID de Contribution: **3** Type: **Non spécifié**

MWL/MM emissions of AGN

lundi 20 novembre 2023 12:00 (30 minutes)

Orateur: OIKONOMOU, Foteini (Norwegian University of Science and Technology (NTNU))

Classification de Session: Introduction

ID de Contribution: **4** Type: **Non spécifié**

Radio transients

Classification de Session: Contributed talks

ID de Contribution: **5** Type: **Non spécifié**

Follow-ups in the radio domain

Classification de Session: Contributed talks

ID de Contribution: **6** Type: **Non spécifié**

Optical surveys: detection of optical transients

Classification de Session: Contributed talks

ID de Contribution: **7** Type: **Non spécifié**

Follow-ups in the optical domain

Classification de Session: Contributed talks

ID de Contribution: **8** Type: **Non spécifié**

General ideas and history

lundi 20 novembre 2023 16:00 (45 minutes)

Orateur: REICHHERZER, Patrick (Ruhr-Universität Bochum (RUB))

Classification de Session: Astro-COLIBRI

ID de Contribution: **9** Type: **Non spécifié**

Current version and features

lundi 20 novembre 2023 16:45 (45 minutes)

Orateur: DE BONY DE LAVERGNE, Mathieu (IRFU, CEA, Université Paris-Sacla)

Classification de Session: Astro-COLIBRI

ID de Contribution: **10** Type: **Non spécifié**

Virtual Observatory

lundi 20 novembre 2023 14:00 (30 minutes)

Orateur: NEBOT, Ada

Classification de Session: MWL+MM platforms

ID de Contribution: **11** Type: **Non spécifié**

GCN

lundi 20 novembre 2023 14:30 (30 minutes)

General Coordinates Network (GCN): NASA's Next Generation Time-Domain and Multimessenger Astronomy Alert System

Abstract:The Gamma-ray Coordinates Network (GCN) is a public collaboration platform run by NASA for the astronomy research community to share alerts and rapid communications about high-energy, multimessenger, and transient phenomena. Over the past 30 years, GCN has helped enable many seminal advances by disseminating observations, quantitative near-term predictions, requests for follow-up observations, and observing plans. GCN distributes alerts between space- and ground-based observatories, physics experiments, and thousands of astronomers around the world. With new transient instruments from across the electromagnetic spectrum and multimessenger facilities, this coordination effort is more important and complex than ever. We introduce the General Coordinates Network, the modern evolution of GCN built on modern, open-source, reliable, and secure alert distribution technologies, and deployed in the cloud. The new GCN is based on Apache Kafka, the same alert streaming technology that has been selected by the Vera C. Rubin observatory. In this talk, we will present the status and design of the new GCN, a tutorial on how to stream alerts, and a vision of its growth as a community resource in the future.

Orateur: RACUSIN, Judith (NASA)

Classification de Session: MWL+MM platforms

ID de Contribution: **12** Type: **Non spécifié**

TNS (tbc)

Classification de Session: MWL+MM platforms

ID de Contribution: **13** Type: **Non spécifié**

ASAS-SN SkyPatrol

mardi 21 novembre 2023 13:30 (30 minutes)

The All-Sky Automated Survey for Supernovae (ASAS-SN) began observing in late-2011 and has been imaging the entire sky with nightly cadence since late 2017. A core goal of ASAS-SN is to release as much useful data as possible to the community. Currently our Sky Patrol platforms allow users to retrieve forced photometry light curves or to query any number of the continuously updated light curves form our catalog of over 100 million targets. Our team is constantly adding tools for light curve analysis, and in the near future we are planning to release a tool for users to setup alert systems on given subsets of our targets that can be triggered in real time as we image the sky. As an open source platform, we not only take in recommendations from the community, but also benefit from a number of direct contributions to our code base.

Orateur: HART, Kyle

Classification de Session: Brokers and follow-up

ID de Contribution: **14** Type: **Non spécifié**

ZTF/LSST brokers (e.g. European Broker Initiative)

lundi 20 novembre 2023 15:00 (30 minutes)

Orateur: NORDIN, Jakob (Humboldt Universität, Berlin)

Classification de Session: MWL+MM platforms

ID de Contribution: **15** Type: **Non spécifié**

SkyPortal

mardi 21 novembre 2023 14:00 (30 minutes)

Orateur: JEGOU DU LAZ, Theophile

Classification de Session: Brokers and follow-up

ID de Contribution: **16** Type: **Non spécifié**

BHTom

mardi 21 novembre 2023 14:30 (30 minutes)

Orateur: WYRZYKOWSKI, Lukasz (Warsaw University Astronomical Observatory)

Classification de Session: Brokers and follow-up

ID de Contribution: **17** Type: **Non spécifié**

Unistellar + SETI

mardi 21 novembre 2023 17:30 (30 minutes)

Orateur: ESPOSITO, Tom

Classification de Session: Citizen science

ID de Contribution: **18** Type: **Non spécifié**

Introduction + topics + group formation

Orateur: SCHÜSSLER, Fabian (IRFU / CEA Paris-Saclay)

Classification de Session: Astro-COLIBRI

ID de Contribution: **19** Type: **Non spécifié**

AAVSO

mardi 21 novembre 2023 16:30 (30 minutes)

Orateur: EGGENSTEIN, Heinz-Bernd (AAVSO)

Classification de Session: Citizen science

ID de Contribution: **20** Type: **Non spécifié**

RAPAS

mardi 21 novembre 2023 16:00 (30 minutes)

Orateur: MIDAVAINE, Thierry

Classification de Session: Citizen science

ID de Contribution: **21** Type: **Non spécifié**

iTelescope (tbc)

Classification de Session: Astro-COLIBRI

ID de Contribution: **22** Type: **Non spécifié**

Welcome

lundi 20 novembre 2023 10:00 (30 minutes)

Orateurs: SCHÜSSLER, Fabian (IRFU / CEA Paris-Saclay); BALKANSKI, Yves (Institut Pascal - UPSaclay)

Classification de Session: Introduction

ID de Contribution: **23** Type: **Non spécifié**

Kilonova-Catcher

mardi 21 novembre 2023 15:00 (30 minutes)

Orateur: ANTIER, Sarah

Classification de Session: Citizen science

ID de Contribution: **24** Type: **Non spécifié**

The United Nations Open Universe Initiative

mardi 21 novembre 2023 17:00 (30 minutes)

Orateur: BARRES DE ALMEIDA, Ulisses

Classification de Session: Citizen science

ID de Contribution: **25** Type: **Non spécifié**

IceCube realtime alerts: science and infrastructure

mardi 21 novembre 2023 09:00 (20 minutes)

In recent years, the IceCube realtime program has been publishing alerts following the detection of neutrinos with moderate-to-high probability of being astrophysical. Such alerts are distributed through the NASA General Coordinates Network in two steps: a prompt notice with preliminary details, followed by a circular containing detailed reconstruction information. In this contribution, I will give an overview of the IceCube realtime activities, focused on the IceCube realtime alert selection criteria and on the ongoing efforts to improve the neutrino directional reconstruction. Finally, I will discuss existing and prospective synergies between the IceCube realtime program and the Astro-COLIBRI platform.

Orateur: LINCETTO, Massimiliano (RUB)

Classification de Session: Contributed talks

ID de Contribution: **26** Type: **Non spécifié**

Online Analysis Framework for Multi-Messenger Astronomy with KM3NeT

mardi 21 novembre 2023 09:20 (20 minutes)

KM3NeT is a Cherenkov-based neutrino telescope under construction in the depth of the Mediterranean sea. It will consist of two main detectors, ARCA and ORCA, sensitive to energies from MeV to PeV. Presently a fraction of both detectors is already data-taking with a completion date foreseen for 2028.
The telescope design allows for a high duty-cycle, a large field of view, and an unprecedented angular resolution which can be as good as 0.1 deg. To turn that into an asset for multi-messenger astronomy, KM3NeT should be able to identify interesting neutrino candidates and send the relevant information of the reconstructed events in a very short time, allowing for a prompt follow-up of events from transient or variable sources by other observatories. In addition, KM3NeT can provide a follow-up of alerts emitted by partner experiments and be used to refine the position of poorly localized triggers, like gravitational wave alerts.

This contribution reports on the status of the KM3NeT online analysis framework that has been running since October 2022. The current performance for KM3NeT/ARCA and KM3NeT/ORCA detectors together with a summary of the most relevant results will be presented, as well as some of the tasks performed by the WP4.3 team of the KM3NeT-INFRADEV2 project.

Orateur: CECCHINI, Vincent (KM3NeT-INFRADEV2, IFIC Valencia, CSIC)

Classification de Session: Contributed talks

ID de Contribution: **27** Type: **Non spécifié**

Searching for sub-TeV neutrino counterparts to sub-threshold gravitational wave events

mardi 21 novembre 2023 09:40 (20 minutes)

Since the release of the Gravitational Wave Transient Catalog GWTC-2.1 by the LIGO-Virgo collaboration, sub-threshold gravitational wave (GW) candidates are publicly available. They are expected to be released in real-time as well, in the upcoming O4 run. Using these GW candidates for multi-messenger studies complements the ongoing efforts to identify neutrino counterparts to GW events. This in turn, allows us to schedule electromagnetic follow-up searches more efficiently. However, the definition and criteria for sub-threshold candidates are pretty flexible. Finding a multi-messenger counterpart via archival studies for these candidates will help to set up strong bounds on the GW parameters which are useful for defining a GW signal as sub-threshold, thereby increasing their significance for setting up follow-up searches. Here, we present the current status of this ongoing work with the IceCube Neutrino Observatory. We perform a selection of the sub-threshold GW candidates from GWTC-2.1 and conduct an archival search for sub-TeV neutrino counterparts detected by the dense-infill array of the IceCube Neutrino Observatory, known as “DeepCore”. An Unbinned Maximum Likelihood method is used for this. We report the 90% C.L. sensitivities and 3 sigma discovery potential flux of this sub-TeV neutrino dataset for each selected sub-threshold GW candidate, considering spatial and temporal correlation between the GW and neutrino events within a 1000 s time window.

Orateur: MUKHERJEE, Tista (IAP, KIT)

Classification de Session: Contributed talks

ID de Contribution: **28** Type: **Non spécifié**

tilepy: rapid tiling strategies in mid/small FoV observatories

mardi 21 novembre 2023 10:30 (20 minutes)

Orateur: SEGLAR ARROYO, Monica (IFIC)

Classification de Session: Contributed talks

ID de Contribution: **29** Type: **Non spécifié**

Powering Source of Gamma Ray Burst Associated Supernovae: Spin-down Millisecond Magnetar?

mardi 21 novembre 2023 11:10 (20 minutes)

The diversity in the observed properties of different types of supernovae (SNe) are crucial to understanding how the life of stars ends differently. Diversity among underlying powering mechanisms may play a vital role among other possible factors (e.g., progenitor, environment). Unique properties and scarcity of Gamma-ray bursts (GRBs) associated SNe (GRB-SNe) seek attention and are exciting for investigating their underlying powering sources. There are three traditional standard models to explain the properties of most of the SNe; radio-active decay of Ni-56 (RD), spin-down millisecond magnetar (MAG), and ejecta-circumstellar interaction (CSM). A magnetar with a spin period of 1 millisecond, mass of 1.4 solar masses, and radius of 10 kilometers has a rotational energy reservoir of nearly 2.2x10ˆ53 ergs, hence can explain the light-curves of various types of SNe, including GRB-SNe. With a given opportunity, I would like to talk about how milliseconds magnetars are the most favorable powering sources of GRB-SNe and will discuss the ultimate tools, such as MOSFiT, MINIM, TigerFit, etc., to probe their characteristics.

Orateur: KUMAR, Amit (University of Warwick)

Classification de Session: Contributed talks

ID de Contribution: **30** Type: **Non spécifié**

Detectability of GRB Optical Prompt and Afterglow with Iranian National Telescope

mardi 21 novembre 2023 11:30 (20 minutes)

Iranian National Observatory Project is a medium size optical telescope with a primary diameter of 3.4m dedicated for observations of galactic/extra galactic and transient sources. The telescope is an optical RC telescope benefitting from on axis Cassegrain focus and side Cassegrain stations. We aim to detect GRB afterglows and optical prompts/ Kilonoveas and the optical counterparts of GW sources with INO and to joint the community of optical follow up observations with ground based telescopes. I will give a report about our telescope and our efforts to prepare for follow up observations including both software and hardware developments.

Orateur: SHAKERI, Soroush (Isfahan University of Technology (IUT))

Classification de Session: Contributed talks

ID de Contribution: **31** Type: **Non spécifié**

Observing Strategy for Electromagnetic Follow-up of Gravitational-Wave Events

mardi 21 novembre 2023 10:50 (20 minutes)

In the realm of multi-messenger astronomy (MMA), Implementing an optimal observing strategy to follow electromagnetic (EM) counterparts across the network observatories is a crucial factor to achieve successful observations. By employing the Multi Order Coverage (MOC) data structure and ranking methods, we present an observing strategy in the context of the GECKOrchester tool. The performance of this strategy is evaluated through its application at the Korean network observatory for ongoing and future observing runs of the Advanced LIGO, Advanced Virgo, and KAGRA collaboration.

Orateur: KHALOUEI, Elahe (Seoul National University)

Classification de Session: Contributed talks

ID de Contribution: **32** Type: **Non spécifié**

Fermi-LAT analysis platforms: FAVA + LCR

Orateur: VALVERDE, Janeth

Classification de Session: Contributed talks

ID de Contribution: **33** Type: **Non spécifié**

Conclusions

vendredi 24 novembre 2023 12:00 (30 minutes)

Orateur: SCHÜSSLER, Fabian (IRFU / CEA Paris-Saclay)

Classification de Session: Sciathon