Allotrope Foundation Quarterly Update 2026/03

Dear Allotrope Community,

We have continued our progress this quarter and improved or expanded the AFO and ASM with updates to share. Please note that access to links may require access to GitLab or other Allotrope Community resources. More details for access here.

Allotrope Foundation Ontology & Data Models (AFO/ASM)

Modeling teams have continued working to align with proposals to expand the domain coverage of the AFO and ASM. Easy access to the released artifacts is available from different resources, and they are detailed below. See www.allotrope.org/product-releases for a full and updated list of available models.

AFO Updates

Following the new and updated set of ASM released this quarter, a new AFO release is published. Please note that QUDT 1.0 is no longer merged into the Allotrope Merged Ontology Suite.

The Allotrope Merged Ontology Suite release is available on:

- BioPortal, the repository of biomedical ontologies published by the National Center for Biomedical Ontology at Stanford University: https://bioportal.bioontology.org/ontologies/AFO
- OLS4, the Ontology Lookup Service repository for biomedical ontologies published by the European Bioinformatics Institute: https://www.ebi.ac.uk/ols4/ontologies/afo
- Ontobee, Ontologies data server published by the University of Michigan Medical School: https://ontobee.org/ontology/AFO (Ontobee generates the AFO list of terms in an Excel spreadsheet as well as Tab Separated Values file)
- FOCUS-SharePoint: Current (Release) Version
- Gitlab: https://gitlab.com/allotrope/afo/-/tree/master/afo
- Allotrope PURL sever: http://purl.allotrope.org/ (listed under AFO>MERGED)
- JFrog Artifactory: https://allotrope.jfrog.io/ui/repos/tree/General/AFO-release-public
- Allotrope website: https://www.allotrope.org/ontologies

The current Release Notes is available on FOCUS-SharePoint: Current (Release) Version

AFO Term Dictionary

Allotrope Term Dictionary is available in both .xlsx (Excel) and .csv (Comma Separated Values) format and can be downloaded from the

- Allotrope website at: https://www.allotrope.org/ontologies
- FOCUS-SharePoint: Current (Release) Version
- JFrog Artifactory: https://allotrope.jfrog.io/ui/repos/tree/General/AFO-dictionary-release-public

Allotrope Foundation Simple Models (ASM)

ASM Directory

ASM Directory for the applicable sample JSON and JSON Schema files per technique is available for convenient viewing of file content using a browser. The directory contains links to the latest sample files and embedded (i.e., standalone) schema for all ASMs in REC (Recommended) status. Please refer to the directory on the public repository: https://gitlab.com/allotrope-public/asm/-/blob/main/README.md#allotrope-simple-model-directory

Modularization

JSON Schemas allow for modularization and factoring out commonly used rules by utilizing references to other JSON schema files. The simple model schemas make use of this modular approach. The ASM Schema is defined using:

- Technique specific schema: a JSON Schema that contains the domain specific rules. It references the core declarations instead of each technique defining its own.
- Core schema: a JSON Schema that contains reusable, domain independent rules. The core schema defines value types for all possible values that may be used in tabular models.
- Other reusable schemas: Cube, Hierarchy, Manifest, Units, other future extensions

Having the basic rules factored out in a core and other schemas allows for later extensions without changing each technique specific schema. It ensures consistent writing and querying regardless of whether it's a single contained instrument or a modular stack with multiple detectors, pumps, or anything else. Motivation of the modular pattern is to drive consistent data structures across techniques, enabling data from different models to work seamlessly together.

ASM Updates

New and updated Allotrope Simple Models released this quarter are available on:

- FOCUS-SharePoint: Current (Release) Version
- GitLab: https://gitlab.com/allotrope/adm/-/tree/master/
- JFrog-- Artifactory: https://allotrope.jfrog.io/ui/repos/tree/General/ADM-release-public

The current Release Notes is available on FOCUS-SharePoint: Current (Release) Version

Here is the list of the new and updated set of ASM models, modules and sub schemas released this quarter. *

ASM Model	Remark	Maturity	Path
Digital Analytical Method	Model	CR	New
Log pattern (as part as the Common Hierarchy)	Sub schema	REC	New
Chromatography Peak enhancement	Sub schema	REC	Update
Evaporative Light Scattering Detector (ELSD) support in LC and LC-MS	Sub schema	REC	Update
Database search matching results (as part as the Common Hierarchy)	Sub schema	REC	New

Fixes for schema validation	Sub schema	REC	Update

* To find out how to access the related model's artifacts on GitLab: https://gitlab.com/allotrope/adm/-/wikis/Summary-Table-of-the-Governed-ADM-and-ASM-Techniques-Artifacts

New ASM Documentation and Technical Guides Repository

We are excited to announce the launch of our new centralized ASM Documentation site on GitLab, designed to ensure consistency of ASM standards across our, design principles, ontological mappings, and other related artifacts.

We are kicking it off by inviting the community to review the technical guides in the repository, starting with the first available draft and with the second coming soon:

- **ASM Extension Guide**: Focuses on custom properties and structural extensions of the ASM.
- **ASM Design Principles Guide**: Provides standardized principles for designing robust ASM models.

Please provide your feedback to the Allotrope Product Team. Thank you for your contributions to strengthening our ASM standards.

ASM Training Materials and Working with the ASM

ASM training material is available on Allotrope public repository at the following locations:

- Brief introduction to ASM: https://www.allotrope.org/allotrope-simple-model
- ASM Primer: https://gitlab.com/allotrope-public/asm-primer/-/wikis/home
- ASM Jupyter Notebook Demo: https://gitlab.com/allotrope-public/asm-jupyter-demo It is a step-by-step example file for working with ASM files in a Jupyter Notebook. It was also tested with Google Colab.

ASM and ADM Modeling and Support

ASM related support tickets can be opened at the ADM project (https://gitlab.com/allotrope/adm/-/issues).

The Product Team can generate ADM specific artifacts (SHACL and its deployment using ADF) by request.

The latest updated set of ASM models is available on Gitlab. New and updated models will be released in conjunction with the release of new tabular models. Adopters can generate example results of tabularized data based on the JSON ASM format.

In cases where there is no tabular model for a chosen instrumentation type or technique, the product team is available to support the drafting of a new tabular model, and the Modeling Working Group is ready to review and govern drafted models.

Tooling, Testing, QA and Automation Pipeline

General Maintenance

- Upgrade dependencies for merger tool: https://gitlab.com/allotrope-open-source/allotrope-devops/-/issues/270
- Update Java tools to newest versions: https://gitlab.com/allotrope/afo/-/merge_requests/300
- Update QA tools to newest versions: https://gitlab.com/allotrope-open-source/ontology-qa-tools/-/merge_requests/120, https://gitlab.com/allotrope-open-source/ontology-qa-tools/-/merge_requests/121

AFO QA Enhancements

We are aiming to enhance the AFO QA tools and the related automation. Next quarter we will be working on the AFO Styleguide Checker:

- Styleguide checker - taxonomy detection not working: https://gitlab.com/allotrope-open-source/allotrope-devops/-/issues/217
- Implement Punning check /Add punning check to merged artifacts: https://gitlab.com/allotrope-open-source/allotrope-devops/-/issues/221, https://gitlab.com/allotrope-open-source/allotrope-devops/-/issues/252
- Enable Styleguide Checker to resolve import: https://gitlab.com/allotrope-open-source/allotrope-devops/-/issues/208

We would like to thank Karin Colsman for her dedication and commitment to improve the overall tooling, testing, QA and automation pipeline.

Working Groups and Special Workstreams Updates

Please note that the working group meetings are recorded to improve access and transparency for those unable to attend or for members interested in staying informed.

To sign up for any working group, go to: www.allotrope.org/working-groups

- **Modeling:** Initiated by the Merck team, the working group is developing a detector model for total protein concentration by UV. Also known as SoloVPE (Variable Pathlength Spectroscopy), it is an advanced analytical instrument, primarily by Repligen, that measures the concentration of biological samples (such as proteins) without dilution by dynamically adjusting the optical pathlength and using "slope spectroscopy" to analyze multiple data points for high accuracy in bioprocessing, QC, and research.
- **Chromatography:** Initiated by Agilent, the working group was developing:
    - A schema for Log pattern to capture information from the instrument or experiment in the ASM file as part of the Common Hierarchy.
    - Enhancements to capturing Peak information by adding additional peak properties.

- Evaporative Light Scattering Detector (ELSD) support in LC and LC-MS for measuring "relative intensity" using Relative Light Unit (RLU) and "absolute intensity" using Milli Volt (mV).
- Fixes for schema validation

The team is also developing a Fraction Collection schema, a technique used in chromatography, especially in liquid chromatography (LC), to isolate and collect specific portions (fractions) of a sample as they elute from the column over time.

- **Mass Spectrometry:** Initiated by Lablicate, the working group was developing a schema for a Database search matching results as part of the Common Hierarchy, designed to support database searching, which is the process of comparing acquired mass spectra against reference databases to identify unknown compounds, proteins, peptides, or microorganisms.
- **Digital Analytical Method:** As a result of last year's Connect events, a dedicated workstream was established to develop the first model of a Digital Analytical Method. Traditionally, analytical methods are manually captured in electronic documents or structured tables within software applications, making them prone to errors, inconsistencies, and incomplete information that can propagate during method transfer. To address today's digital challenges, methods should instead be defined as machine-readable instructions that interact directly with software, improving data integrity and enabling seamless linkage to results for easier interpretation and troubleshooting.

Allotrope Framework Implementations Within and Outside the Allotrope Community

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Sample Open Source Implementations with ASM

- **Anthropics Bio-Research Plugins:** Anthropic project called "knowledge-work-plugins", is an open-source collection repository of several domain-specific plugins ("skills") that extend Claude's capabilities for professional knowledge work and abilities to integrate with MCP servers. Specifically, the Bio-Research plugins include Instrument data to Allotrope ASM format converters. The code is on GitHub and includes a validator. It is using the Benchling "Allotropy" python package as a parser.

- **Benchling Connect Platform:** Benchling is developing its platform for lab instrument connectivity and data management, Benchling Connect. It performs instrument data conversion to ASM. Benchling confronts industry-wide challenges with proliferation of proprietary instrument data models and vendor lock-in by mapping all instrument output to the Allotrope Simple Model (ASM) and making the converter codes open source and freely available on GitHub. The Python project is called Allotropy. For an up-to-date list of available instrument converters please refer to the following GitHub page: https://github.com/Benchling-Open-Source/allotropy/blob/main/SUPPORTED_INSTRUMENT_SOFTWARE.adoc

- **Lablicate OpenChrom plugins:** Lablicate is working on ASM plugins for its OpenChrom platform (a multivendor CDS platform with additional spectroscopy and molecular biology support). Plugins convert data to and from ASM.

- **ASM as a series of Validators:** Ganymede is a cloud-based data platform, engineered to streamline the capture and processing of data between lab instruments, ELN/LIMS/analytical applications. Ganymede can convert instrument data files into the Allotrope format using ASM mapper. Its SDK utilizes ASM as a series of validators built in the Pandera framework

- **chromeConverter - Open-Source R Tool for Chromatography Data Analysis:** chromeConverter is an open-source R tool (a language and environment for statistical computing and graphics) designed to streamline the conversion of chromatography data into formats easily readable in R for advanced analysis. It features internal parsers written in R and bindings to external libraries, now including support for the Allotrope ASM format.
  For more information, visit the GitHub project site or the R Package Documentation README

- **ASM Converters in Java:** IFP Energies Nouvelles (IFPEN), a French public research, innovation and training organization in the fields of energy, transport and the environment is developing a set of open-source converters to several ASM models and several instruments. The project is managed and developed by Maxime Visconte, Industrial and lab IT manager at IFPEN. More information can be found on IFPEN's GitHub repository. A set of utilities, shared between all the ASM converters were pushed to the Maven central repository. A presentation of this project is available on our YouTube channel: here

- **LADS Showcase:** A collection of LADS-compliant OPC UA server implementations is now available on GitHub, demonstrating integration with Allotrope Foundation Ontologies (AFO) and the Allotrope Simple Model (ASM) across a range of laboratory device classes. Access the code on GitHub

- **OPC UA LADS FAIR-by-Design:** The OPC UA LADS FAIR-by-Design ecosystem projects are focused on accelerating the development of laboratory data infrastructures that are FAIR by design. Two new open-source components are now available on GitHub, showcasing integration with the Allotrope Foundation Ontology (AFO) and the Allotrope Simple Model (ASM) across a variety of laboratory device classes. Access the source code on GitHub

- **ASM Class Generation:** An IFP Energies Nouvelles (IFPEN) open-source project aims to create libraries of classes that are compatible with the ASM JSON files (ie. a compliant JSON file can be deserialized into one of the classes). It has a class generator, that creates classes compatible with ASM in many languages (so far, Java and TypeScript are public, Python is on the way. More information on GitHub

Sample Implementations with the Allotrope Framework

- **Allotrope Simple Model for NMR Experiments with Mnova 16:** Mestrelab Research's Mnova 16, a multi-vendor analytical chemistry software suite designed for processing and analyzing data from various analytical techniques, now supports data exchange for NMR experiments in the Allotrope Simple Model (ASM) format—making it easier to integrate NMR results into standardized, interoperable scientific data ecosystems. Users can now both import and export NMR data in ASM format, enhancing compatibility with Allotrope-compliant systems and workflows. Learn more about Mnova 16 features: Link

- **Spectaris LADS Showcases Integration of OPC UA with Allotrope Standards:** Spectaris, Allotrope Foundation and the OPC Foundation are proud to announce a major milestone in smarter labs by advancing semantic interoperability and structured data standards in laboratory environments: At the most recent, and now 8th hackathon, which took place on April 11, 2025 in Germany and once again featured various companies, from device manufacturers, software providers to even laboratory operators, a successful demonstration showcased the integration of Allotrope Foundation Ontologies (AFO) and the Allotrope Simple Model (ASM) into the OPC UA (Unified Architecture) framework. Read the press release at EIN Presswire (Full PDF version)

Allotrope Publications and Media

We have published 2-page summaries and updated the introductory presentation:

- **Allotrope Introductory Slide Deck**: can be downloaded from FOCUS-SharePoint: Overview Slides
- **Allotrope Models & Domains**: can be downloaded from FOCUS-SharePoint: Summary Documents
- **Allotrope Data Strategies**: can be downloaded from FOCUS-SharePoint: Summary Documents

Allotrope YouTube Channel

Our YouTube channel has new a handle: https://www.youtube.com/@allotropefoundation. The Allotrope YouTube Channel hosts a technical playlist as well as the Allotrope Connect public presentations from 2017 and 2020 to the latest 2024 Fall Connect event.

The YouTube Channel videos are organized by playlists at:
https://www.youtube.com/@allotropefoundation/playlists.

Allotrope on LinkedIn

The Allotrope LinkedIn page is very active, with frequent updates and new posts. We encourage you to stay connected and follow us at: https://www.linkedin.com/company/allotrope-foundation

Allotrope Data Framework Onboarding Guide

The Allotrope Onboarding Guide wiki page was updated. Please refer to the following link: Allotrope Data Framework Onboarding Guide

Allotrope in the News

For the latest list of "Allotrope in the News", please visit our website at: https://www.allotrope.org/allotrope-in-the-news

AF Community and Events

Hosted by Johnson & Johnson in Leiden, Netherlands: 2026 Spring Allotrope® Connect Workshop

We're excited to announce that registration for the 2026 Spring Allotrope Connect Workshop is now open. By popular demand, the Allotrope Connect Workshop is returning to Europe this spring, hosted by Johnson & Johnson in Leiden, Netherlands on May 5–7, 2026.

Registration and Information at 2026 Spring Allotrope® Connect Workshop

Call for Abstracts: Creating AI-Ready Laboratories - 2026 Spring Allotrope® Connect Workshop

We invite industry experts, researchers, data architects, and technology partners to share their insights, progress, and vision at the upcoming Spring Allotrope Connect. As we gather in Leiden, our focus is on moving beyond theory to achieve scalable, standardized data environments that serve as the bedrock for the creation of AI-Ready Laboratories.

Read the post on LinkedIn, Submit your abstract to info@allotropefoundation.org

ASM Certification Program

We are excited to announce the launch of the ASM Certification Program, a new initiative designed to ensure consistent and interoperable implementation of ASM across all instruments, platforms, and workflows. The program fosters industry trust and provides organizations with unique recognition and branding opportunities. Our goal is to drive continuous improvement and maintain seamless alignment as the ASM standard continues to evolve.

Organizations are welcome to register, test their ASM products, and provide valuable feedback. Detailed information and documentation are available at ASM Certification Program.

Looking Forward

The Allotrope Product Team is looking forward to another productive 2nd quarter of 2026. We are looking to develop additional improvements to meet the evolving needs of our community.

Please contact us for any questions at product_team@allotrope.org.

Sincerely,

Allotrope Product Team