



Allotrope Foundation Quarterly Update 2026/09

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.

Allotrope Foundation Ontology & Data Models (AFO/ASM)	2
AFO Updates.....	2
AFO Term Dictionary	2
Allotrope Foundation Simple Models (ASM).....	2
ASM Directory.....	2
Modularization	3
ASM Updates	3
ASM Documentation and Technical Guides Repository.....	4
ASM Training Materials and Working with the ASM.....	4
ASM and ADM Modeling and Support	4
Tooling, Testing, QA and Automation Pipeline	4
General Maintenance.....	4
Working Groups, Projects, and Special Workstreams Updates	5
Allotrope Foundation Programs	6
Allotrope Framework Implementations Within and Outside the Allotrope Community.....	7
Sample Open-Source Implementations with ASM	7
Sample Implementations with the Allotrope Framework.....	9
Allotrope Publications and Media	9
Allotrope YouTube Channel.....	10
Allotrope on LinkedIn	10
Allotrope Data Framework Onboarding Guide	10
Allotrope in the News.....	10
Looking Forward	10

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 <https://allotropefoundation.org/our-standardized-content/> 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>

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

- 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, detectors and sub schemas released this quarter. *

ASM Model/Schema/Detector	Remark	Maturity	Path
Physical Characterizations ASMs: XRPD, DVS, DSC, TGA	Model	REC	Update
Support Calculated Data document under Processed Data document	Schema	REC	Update
Custom Information Document supports for identifier and description	Schema	REC	Update
Refractive Index Detection (RID) chromatogram in LC	Detector	REC	Update
3D Mass Spectrum	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>



ASM Documentation and Technical Guides Repository

Last quarter we announced the of a centralized [ASM Documentation](#) site on GitLab, designed to ensure consistency of ASM standards across our design principles, ontological mappings, and other related artifacts.

We kicked off by inviting the community to review the first two drafts of [technical guides](#) available in the repository:

- **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

- Use shasum instead of stat in fetch-tool (for cross-platform support):
https://gitlab.com/allotrope-open-source/allotrope-devops/-/work_items/272 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 Colman for her dedication and commitment to improving the overall tooling, testing, QA and automation pipeline.

Working Groups, Projects, 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.

Signing up for any working group is done through the FOCUS platform. Video and PDF instructions for joining can be found here: <https://focus.faegredrinkercollaborate.com/sign-up-instructions/>. If you have already signed up for FOCUS, you can skip to Step 2: Sign up for Groups.

- **Datacube Enhancement WG:**

Following discussions at the recent Allotrope Connect workshop in Leiden, we would like to invite participants to join the new Datacube Enhancement Working Group, focused on proposing solutions to challenges associated with the use of ASM datacubes in high-data-volume domains such as Mass Spectrometry and NMR. The Working Group meets biweekly on Mondays at 11:00 AM ET.

The Working Group members are currently Investigating the [CBOR](#) file format with compression, including: Compare with simple binary, Binary streaming, Check ease-of-use, Check file-size, Check performance, language support (Python, C#, Java) and Bit shuffling

We would like to thank John Hollerton from SciY for stepping forward and serving as the Chair of the working group.

- **Modeling WG:**

Common Hierarchy Schema enhancements: The Modeling Working Group has continued to enhance the Common Hierarchy Schema by adding support for Calculated Data

documents under Processed Data documents. This update allows data processing to include multiple calculations and outputs, while providing the greater level of detail for each output that the Calculated Data document provides. In addition, a Custom Information Document now supports identifier and description to enable identification of custom fields and provide additional descriptive information.

- **Chromatography WG:**

Initiated by Agilent, the LC model was updated to support Refractive Index Detection (RID) chromatograms. In addition, the working group is developing support for Gel Permeation Chromatography (GPC), initiated by BASF, and working with the Merck team to align the model with Size Exclusion Chromatography (SEC).

- **Mass Spectrometry WG:**

The Mass Spectrometry Working Group has continued to evolve the ASM model to better support the representation of mass spectrometry data. Recent updates include support for 3D mass spectra. In addition, the working group is developing the ability to represent deconvoluted peak profiles (initiated by Lablicate), providing richer context and more complete representation of mass spectrometry results.

- **Connected Domains initiative - Physical Characterization models update:**

Last quarter, the Product Team released an ASM CR model for Connected Domains, establishing a foundational skeleton that will span materials, instruments, results, equipment, methods, processes, and specifications. This model is shaped to support key use cases such as reaction analysis and stability study data. To enable this, a set of interconnected ASM domain relationships, classes, and modular schemas, including Physical Characterization methods, were developed. The Physical Characterization methods were evaluated by the Product Team and aligned with many new supporting ontology terms. In addition, the following Physical Characterization models were refactored, modularized, and updated to support the Connected Domains model: XRPD (X-Ray Powder Diffraction), DSC (Differential Scanning Calorimetry), TGA (Thermogravimetric Analysis), DVS (Dynamic Vapor Sorption). Additional updates to Titration and Raman models are under development.

Allotrope Foundation Programs

Announcement: Community Artifacts and Data Submission Portal



We are excited to announce the pilot launch of the Community Artifacts and Data Submission Portal, a new initiative designed to help our community capture, share, and preserve valuable knowledge artifacts and datasets.

Every contribution strengthens our collective knowledge base and accelerates progress toward laboratory digital transformation, automation, interoperability, and AI-enabled scientific innovation.

The portal utilizes the community FOCUS collaboration platform. If you do not have access yet, please go to the [sign-up instructions](#) for step-by-step guidance and videos on how to register.

To access the portal, please refer to: [Submission Portal](#)

ASM Certification Program

In April, we announced the ASM Certification Program. As we continue to refine and validate the program, we are seeking additional member organizations to participate in its evaluation and testing.

If you are interested in participating, please contact the Product Team directly. Detailed information, including the Quick Start Guide and Program Terms, is available at the [ASM Certification Program Landing Page](#). Your feedback and participation will help ensure the program effectively meets the needs of the Allotrope community. Thank you for your consideration.

Allotrope Framework Implementations Within and Outside the Allotrope Community

Sample Open-Source Implementations with ASM

- **AWS ASM Transformation Service - Allotrope as a Service:** AI-powered ASM (Allotrope Simple Model) transformation service for pharmaceutical laboratory data. Converts instrument output files to regulatory-compliant ASM format using AWS Bedrock Claude and the allotropy library. The project can be found on GitHub at [ASM Transformation Service - Allotrope as a Service](#)
- **AWS Allotrope MCP Server:** A Model Context Protocol (MCP) server that provides tools for working with Allotrope Simple Model (ASM) data formats. The server enables AI assistants to validate instrument data files against ASM schemas and discover available ASMs. It's a set of development tools to make it easier for AI assistants to interact with ASM data. The project can be found on GitHub at [Allotrope MCP Server](#)
- **Anthropic 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

- **ZONTAL Studio – ASM Language Features for Visual Studio Code:** ZONTAL has released a Visual Studio Code extension designed to simplify the creation, editing, and validation of ASM files. The extension provides rich language support for ASM, including syntax highlighting, IntelliSense, schema-driven validation, hover documentation, document formatting, and navigation features. By leveraging ASM manifests, users receive real-time guidance and validation against Allotrope specifications, helping improve data quality and development efficiency. The solution also supports Turtle and N-Triples files, integrates with GitHub Copilot Chat for ASM-related assistance, and can work with resources from the Allotrope public repository. This new tool provides a modern developer experience for organizations building, maintaining, and validating ASM-based data solutions within the Allotrope ecosystem. The extension is available free of charge through the Visual Studio Marketplace and can be installed directly from the marketplace listing. Please refer to: [ZONTAL Studio - Allotrope Simple Model \(ASM\) Language Features - Visual Studio Marketplace](#)
- **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 leave Behind Card:** 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 2026 Spring Connect Workshop 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://allotropefoundation.org/allotrope-in-the-news/>

Looking Forward

The Allotrope Product Team is looking forward to another productive 4th 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