

## Unit Representation Systems as of December 5, 2022 (CODATA DRUM TG)

Title	Type	Format	Website	Scope	Developers	Contact	Governance	Licensing	Maintenance	Entity	Last Update
Astropy	Library	Python	<a href="https://www.astropy.org">https://www.astropy.org</a>	Units for Astronomy	Group	<a href="mailto:feedback@astropy.org">feedback@astropy.org</a>	<a href="https://github.com/astropy/astropy">https://github.com/astropy/astropy</a>	BSD-3-Clause License	GitHub project	astropy.org	10/23/22
Ayurvedic units converter	Library	Python, Flask	<a href="https://github.com/sanjaytharagesh31/Hackathon-Ayurveda">https://github.com/sanjaytharagesh31/Hackathon-Ayurveda</a>	Converting ancient units	Sanjay Tharagesh	<a href="mailto:sanjay311999@gmail.com">sanjay311999@gmail.com</a>	?	?	GitHub project	?	2019
Boost Units	Library	C++	<a href="https://github.com/boostorg/units">https://github.com/boostorg/units</a>	Units for C++	Steven Watanabe	?	<a href="http://boost.org">http://boost.org</a>	Boost Software License	GitHub project	Boost.org	6/9/21
Caliper	Library	Java	<a href="https://github.com/point85/caliper">https://github.com/point85/caliper</a>	Units for Java	Kent Randell	<a href="mailto:point85_lc@gmail.com">point85_lc@gmail.com</a>	?	MIT License	GitHub project	?	8/27/21
CaliperSharp	Library	C++	<a href="https://github.com/point85/CaliperSharp">https://github.com/point85/CaliperSharp</a>	Units for C++	Kent Randell	<a href="mailto:point85_lc@gmail.com">point85_lc@gmail.com</a>	?	MIT License	GitHub project	?	8/28/21
Climate and Forecast Units	Library	Python	<a href="https://github.com/SciTools/CF-Units">https://github.com/SciTools/CF-Units</a>	Wrapper for UDUNITS-2 (Climate/Forecast)	Phil Elson	<a href="mailto:pelson.pub@gmail.com">pelson.pub@gmail.com</a>	UK Met Office	LGPL-3.0 License	GitHub project	UK Project	7/13/22
Craft-Units	Library	PHP	<a href="https://github.com/nystudio107/craft-units">https://github.com/nystudio107/craft-units</a>	Units plugin for the Craft CMS	Andrew Welch	Message via LinkedIn	?	MIT License	GitHub project	<a href="https://nystudio107.com">https://nystudio107.com</a>	5/17/22
Eclipse UOMO	Library	Java, Eclipse	<a href="http://www.eclipse.org/uomo/">http://www.eclipse.org/uomo/</a>	Software units via the Java API (UCUM, Ma	Werner Keil	<a href="mailto:uomo@catmedia.us">uomo@catmedia.us</a>	Eclipse Foundation	?	Eclipse Foundation	?	6/16/21
ERDAP UDUNITS/UCUM converter	Website	REST	<a href="https://coastwatch.pfeg.noaa.gov/erdap/convert/units.html">https://coastwatch.pfeg.noaa.gov/erdap/convert/units.html</a>	UDUnits to UCUM Converter	Robert Simons	<a href="mailto:bob.simons@noaa.gov">bob.simons@noaa.gov</a>	NOAA	?	Web form	NOAA ERDDAP	?
Fhir.Metrics	Library	.NET	<a href="https://github.com/FirelyTeam/Fhir.Metrics">https://github.com/FirelyTeam/Fhir.Metrics</a>	UCUM implementation for FHIR	Alexander Zautke	<a href="mailto:alexander.zautke@googlemail.com">alexander.zautke@googlemail.com</a>	?	BSD-3-Clause License	GitHub project	?	7/5/21
FIBO	Database	RDF	<a href="https://spec.edmcouncil.org/fibo/ontology/FND/Quantities/Quantities">https://spec.edmcouncil.org/fibo/ontology/FND/Quantities/Quantities</a>	Ontology for Quantities and Units	EDM Council (Financial Industry)	<a href="mailto:info@edmcouncil.org">info@edmcouncil.org</a>	FIBO	MIT License	Website	FIBO Interest Group	2021
Gu.Units	Library	C#	<a href="https://github.com/GuOrg/Gu.Units">https://github.com/GuOrg/Gu.Units</a>	Units for C#	Johan Larsson	<a href="mailto:johan.gavle1@hotmail.com">johan.gavle1@hotmail.com</a>	?	MIT License	GitHub project	?	11/22/22
GNU Units	OS	C++	<a href="https://www.gnu.org/software/units/">https://www.gnu.org/software/units/</a>	GNU operating system units	Adrian Mariano	<a href="mailto:adrianm@gnu.org">adrianm@gnu.org</a>	Free Software Foundation	GNU General Public License	Free Software Foundation	Free Software Foundation	5/29/16
IDMP	Ontology	OWL	<a href="https://github.com/edmcouncil/idmp">https://github.com/edmcouncil/idmp</a>	Ontology for identification of medical products	Elisa Kendall	<a href="mailto:ekendall@thematrix.com">ekendall@thematrix.com</a>	Pistoia Alliance/EDM	MIT License	GitHub project	IDMP	12/5/22
IVOA (UPDATED)	Encoding	Text	<a href="https://ivoa.net/documents/VOUnits/20220525/index.html">https://ivoa.net/documents/VOUnits/20220525/index.html</a>	The International Virtual Observatory Alliance	Markus Demleitner, Sebastian Ted Diehl	<a href="mailto:msdemle@ar.uni-heidelberg.de">msdemle@ar.uni-heidelberg.de</a>	IVOA Semantics Working Group	IVOA Semantics Working Group	IVOA Semantics Working Group	IVOA	5/25/22
Komuocopia® ML™	Software	MatLAB	<a href="https://bodietech.com/index.php/komuocopia/">https://bodietech.com/index.php/komuocopia/</a>	Computation within MatLAB	Ted Diehl	<a href="mailto:ted.diehl@bodietech.com">ted.diehl@bodietech.com</a>	?	Paid license (software)	<a href="https://bodietech.com">https://bodietech.com</a>	BodieTech	6/8/22
LHC UCUM Library	Library	JavaScript	<a href="https://lhncbc.github.io/ucum-lhc/">https://lhncbc.github.io/ucum-lhc/</a>	JavaScript library for validation/conversion of units	Gunther Schadow, Clement J. Michael	<a href="mailto:gunther.schadow@gmail.com">gunther.schadow@gmail.com</a>	NIH	NIH License	NIH	NIH Lister Hill National Center for Biomedical Communications	1/1/21
Mathematica	Website	HTML	<a href="https://reference.wolfram.com/language/guide/Units.html">https://reference.wolfram.com/language/guide/Units.html</a>	How to use units in Wolfram	Michael Trot	<a href="mailto:mtrott@wolfram.com">mtrott@wolfram.com</a>	Wolfram	?	Wolfram	Wolfram	?
mathjs	Library	JavaScript	<a href="https://github.com/josdejong/mathjs">https://github.com/josdejong/mathjs</a>	MathJs package for JavaScript and Node.js	Jos de Jong	<a href="mailto:josdejong@gmail.com">josdejong@gmail.com</a>	?	Apache-2.0 License	GitHub project	?	12/5/22
Measurement Units for R	Library	R	<a href="https://r-quantities.github.io/units/">https://r-quantities.github.io/units/</a>	Units for the R language	Edzer Pebesma	<a href="mailto:edzer.pebesma@uni-muenster.de">edzer.pebesma@uni-muenster.de</a>	?	GPL-2	GitHub project	?	2/5/22
NERC Vocabulary for Units	Dataset	RDF	<a href="http://vocab.nerc.ac.uk/collection/P06/current/">http://vocab.nerc.ac.uk/collection/P06/current/</a>	Controlled vocab of units for the oceanographic community	Gwen Moncoiffé	<a href="mailto:gmon@bodc.ac.uk">gmon@bodc.ac.uk</a>	BODC	?	GitHub project	BODC	12/3/22
OM	Dataset	RDF	<a href="https://github.com/HajoRijgersberg/OM">https://github.com/HajoRijgersberg/OM</a>	Units of measurement ontology	Hajo Rijgersberg	?	?	?	GitHub project	?	11/27/22
PHP Units of Measure	Library	PHP	<a href="https://github.com/PhpUnitsOfMeasure/php-units-of-measure">https://github.com/PhpUnitsOfMeasure/php-units-of-measure</a>	PHP library for units of measurement	Jonathan Hanson	Added issue to github	?	MIT License	GitHub project	?	12/7/17
PINT	Library	Python	<a href="https://github.com/hgrecco/pint">https://github.com/hgrecco/pint</a>	Units of measurement for Python	Herman Grecco	<a href="mailto:hgrecco@df.uba.ar">hgrecco@df.uba.ar</a>	?	Special license	GitHub project	?	11/29/22
PixelMed™ Java UCUM Toolkit	Library	Java	<a href="http://pixelmed.com/ucum.html">http://pixelmed.com/ucum.html</a>	UCUM parser/converter/validator	?	<a href="mailto:info@pixelmed.com">info@pixelmed.com</a>	?	Restrictive?	Website	PixelMed Publisher	10/29/18
PYUCUM	Library	Python	<a href="https://github.com/stomioka/ucum">https://github.com/stomioka/ucum</a>	Python wrapper for creating UCUM units	?	Added issue to github	?	?	Website	?	6/18/20
QuantityTypes for .NET	Library	.NET	<a href="https://github.com/QuantityTypes/QuantityTypes">https://github.com/QuantityTypes/QuantityTypes</a>	Typed physical quantities for .NET	Oystein Bjarke	<a href="mailto:oystein.bjarke@dnv.com">oystein.bjarke@dnv.com</a>	?	MIT License	GitHub project	?	8/23/22
QUdt	Vocabulary	RDF	<a href="https://github.com/qudt/qudt-public-repo">https://github.com/qudt/qudt-public-repo</a>	Ontology for units, quantities, kinds, and dimensions	Ralph Hodson, Steve Ray, Jacla	<a href="mailto:steve_ray@qudt.org">steve_ray@qudt.org</a>	qudt.org	CC 4.0 Open	Board of directors	Not for profit	12/1/22
QUdV	Dataset	RDF	<a href="https://www.omgwiki.org/OMGSysML/doku.php?id=sysml-qudv:qu">https://www.omgwiki.org/OMGSysML/doku.php?id=sysml-qudv:qu</a>	Library of units, quantities, dimensions and	OMG Standards Development	<a href="mailto:qudv-request@omg.org">qudv-request@omg.org</a>	OMG SysML	?	?	?	2009
Ruby Units	Library	Ruby	<a href="https://github.com/obrich/ruby-units">https://github.com/obrich/ruby-units</a>	Units of measurement for Ruby	Kevin Obrich	Added issue to github	?	MIT License	?	?	10/25/22
Safe Units	Library	TypeScript	<a href="https://github.com/scheinj/safe-units">https://github.com/scheinj/safe-units</a>	Type-safe TypeScript units of measurement	Jonah Scheinerman	<a href="mailto:jonah@scheinerman.net">jonah@scheinerman.net</a>	?	MIT License	?	?	1/31/20
SI	Text	PDF	<a href="https://www.bipm.org/en/publications/si-brochure/">https://www.bipm.org/en/publications/si-brochure/</a>	Definition of the SI unit system	Martin Milton	<a href="mailto:martin.milton@bipm.org">martin.milton@bipm.org</a>	BIPM	Open license	Website	BIPM	5/20/19
siunitx	Formatting	LaTeX	<a href="https://github.com/josephwright/siunitx">https://github.com/josephwright/siunitx</a>	Latex formatting of SI units	Joseph Wright	<a href="mailto:joseph.wright@uea.ac.uk">joseph.wright@uea.ac.uk</a>	?	LaTeX Project Public License	15 developers	Community group	12/5/22
SmartCom Project	Vocabulary	XML	<a href="https://www.ptb.de/siv1.3.1/SI_Format.xsd">https://www.ptb.de/siv1.3.1/SI_Format.xsd</a>	Unit encoding	Daniel Hutzschenreuter	<a href="mailto:Daniel.Hutzschenreuter@ptb.de">Daniel.Hutzschenreuter@ptb.de</a>	PTB	?	?	<a href="https://www.ptb.de/empir2018/smartc">https://www.ptb.de/empir2018/smartc</a>	9/1/21
Squants	Library	Scala	<a href="https://github.com/tyeaveley/squants">https://github.com/tyeaveley/squants</a>	Scala API for quantities, units and dimensions	Carlos Quiroz	<a href="mailto:carlos.m.quiroz@gmail.com">carlos.m.quiroz@gmail.com</a>	?	Apache-2.0 License	?	?	12/2/22
SWEET	Database	RDF	<a href="https://github.com/ESIPFed/sweet">https://github.com/ESIPFed/sweet</a>	Semantic Web for Earth and Environmental Science	Lewis John McGibbney	<a href="mailto:lewis.mcgibbney@gmail.com">lewis.mcgibbney@gmail.com</a>	ESIP	CC 1.0	GitHub project	ESIP	7/18/22
UCUM (Original Site)	Dataset	XML	<a href="https://ucum.org/ucum-essence.xml">https://ucum.org/ucum-essence.xml</a>	Replaced by the NIH site	NLM (Regenstrief Institute)	<a href="mailto:clemmcdonald@mail.nih.gov">clemmcdonald@mail.nih.gov</a>	NIH	<a href="https://ucum.org/trac/">https://ucum.org/trac/</a>	NIH	US Government	11/21/17
UCUM Transformation Webservices	API	Java, REST	<a href="https://sourceforge.net/projects/ucum-transformation-webserv/">https://sourceforge.net/projects/ucum-transformation-webserv/</a>	UCUM unit conversion service	Jozef Aerts	<a href="mailto:Jozef.Aerts@XML4Pharma.com">Jozef.Aerts@XML4Pharma.com</a>	?	?	?	?	9/4/16
UDUNITS	Library	XML	<a href="https://www.unidata.ucar.edu/software/udunits/">https://www.unidata.ucar.edu/software/udunits/</a>	Units for the atmospheric community	Steve Emmerson	<a href="mailto:emmerson@ucar.edu">emmerson@ucar.edu</a>	UCAR	UCAR license	GitHub project	US Government	12/28/20
UNECE/CEFACT	Dataset	Excel	<a href="https://github.com/unecefact/vocab">https://github.com/unecefact/vocab</a>	Units for international trade	Nis Jespersen	Added issue to github	UN/CEFACT	?	GitHub project	UN/CEFACT	12/2/22
Unit Ontology	Dataset	RDF	<a href="https://github.com/bio-ontology-research-group/unit-ontology/">https://github.com/bio-ontology-research-group/unit-ontology/</a>	Units of measurement ontology	?	Added issue to github	?	CC-BY-4.0 License	GitHub project	?	10/20/22
Units	Library	C++	<a href="https://github.com/nholthaus/units">https://github.com/nholthaus/units</a>	Unit conversion library for C++	Nic Holthaus	<a href="mailto:nholthaus@gmail.com">nholthaus@gmail.com</a>	?	?	MIT License	?	10/7/22
Units of Measurement API	Library	Java	<a href="https://github.com/units-of-measurement/unit-api">https://github.com/units-of-measurement/unit-api</a>	Java API for Units and Quantities	Werner Keil	<a href="mailto:uomo@catmedia.us">uomo@catmedia.us</a>	Eclipse Foundation	?	GitHub project	?	12/5/22
UnitsML	Encoding	XML	<a href="https://unitsml.nist.gov/">https://unitsml.nist.gov/</a> OR <a href="https://github.com/unitsml">https://github.com/unitsml</a>	Units of measurement for XML	Ronald Tse (was NIST)	<a href="mailto:ronald.tse@ribose.com">ronald.tse@ribose.com</a>	Ribose Inc.	?	GitHub project	?	6/10/21
UnitsNet	Library	.NET	<a href="https://github.com/angularsen/UnitsNet">https://github.com/angularsen/UnitsNet</a>	Quantities and units for .NET (stringly typed)	Andreas Gullberg Larsen	<a href="mailto:andreas.larsen84@gmail.com">andreas.larsen84@gmail.com</a>	?	Open license	GitHub project	?	12/2/22
Unitwise	Library	Ruby	<a href="https://github.com/joshwlewis/unitwise">https://github.com/joshwlewis/unitwise</a>	Quantities and units for Ruby	Josh W Lewis	<a href="mailto:josh.w.lewis@gmail.com">josh.w.lewis@gmail.com</a>	?	MIT License	GitHub project	?	10/24/22
Unity	Library	C, Java	<a href="https://purl.org/ncq/dists/unity">https://purl.org/ncq/dists/unity</a>	Code in support of the IVOA units (10.5281)	Norman Gray	<a href="mailto:norman.gray@glasgow.ac.uk">norman.gray@glasgow.ac.uk</a>	IVOA	BSD license	Website	IVOA	4/10/22
US NIH UCUM API	API	REST	<a href="https://ucum.nlm.nih.gov/ucum-service.html">https://ucum.nlm.nih.gov/ucum-service.html</a>	UCUM unit conversion service	NIH	?	NIH	NIH License	NIH	NIH Lister Hill National Center for Biomedical Communications	11/18/20
W3C Library of Quantity Kinds (Legacy)	Dataset	RDF	<a href="https://www.w3.org/2005/incubator/ssn/ssnx/qu/qu">https://www.w3.org/2005/incubator/ssn/ssnx/qu/qu</a>	Library of units, quantities, dimensions and	OMG SysML	<a href="mailto:qudv-request@omg.org">qudv-request@omg.org</a>	OMG SysML	?	?	?	2009
Wolfram Alpha	Website	HTML	<a href="https://www.wolframalpha.com/examples/science-and-technology">https://www.wolframalpha.com/examples/science-and-technology</a>	Example units and measures in Wolfram	Alf Michael Trot	<a href="mailto:mtrott@wolfram.com">mtrott@wolfram.com</a>	Wolfram	?	Wolfram	Wolfram	?
World Meteorological Office Unit Codes	Dataset	RDF	<a href="http://codes.wmo.int/wmdr/ unit">http://codes.wmo.int/wmdr/ unit</a>	Units code registry for meteorology	Dave Reynolds	<a href="mailto:dave.e.reynolds@gmail.com">dave.e.reynolds@gmail.com</a>	UN/WMO	?	UN/WMO	UN/WMO	?