

# Creating an Internet version of the database of maser sources

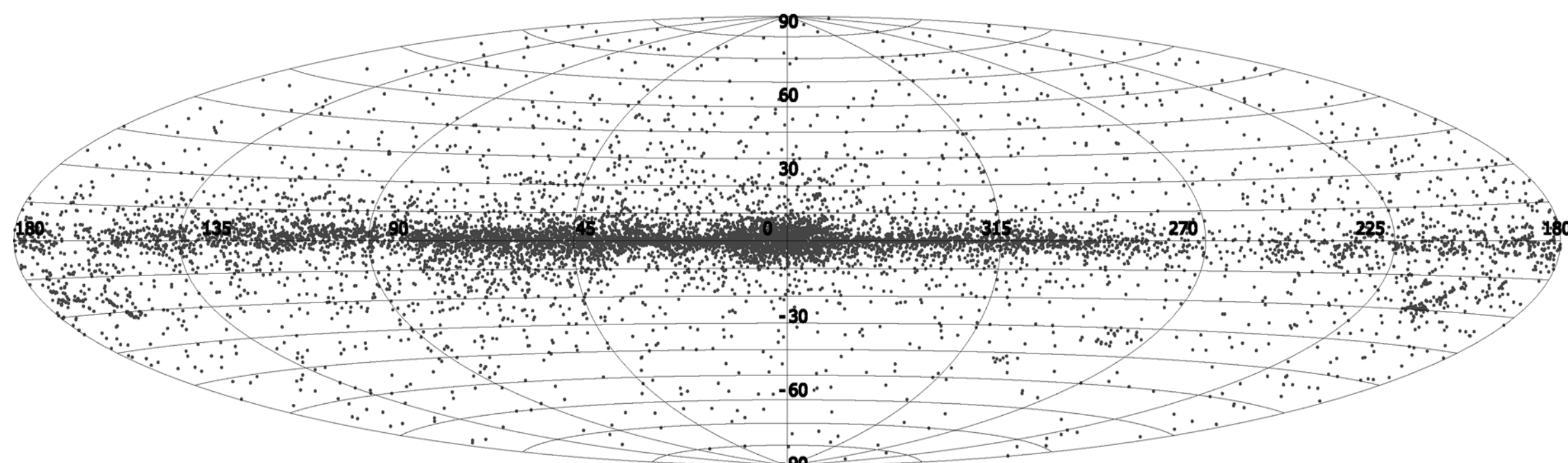
Ladeyschikov D.A., Nakashima J.-I., Sobolev A.M.,  
Engels D. (U. of Hamburg), Zhang Y. (Sun Yet-sen U.), Hsia C. -H. (Macau U. of  
Sci. & Tech.), Yung B. H. K. (CAMK, Torun), Imai H. (Kagoshima U)

# Abstract

To solve the problem of searching and organizing data on astronomical maser sources, the online code **maserdb** was created, for storing, analyzing and visualizing data on maser sources. The system is designed to **store large amounts of data on maser emission in various lines of the interstellar medium**, including negative registrations. There is the possibility of identifying maser sources with data from popular astronomical catalogs.

At the moment, the system has been successfully applied for the **eDAMS** project - an extensive Database of Astrophysical Maser Sources, whose goal is to collect the most complete information about near-stellar maser sources in H<sub>2</sub>O, OH and SiO lines. For this purpose, more than 30 thousand observations from various sources in 10 thousand objects have already been collected.

Site address – <http://maserdb.ins.urfu.ru>



**Figure 1.** Position of all objects ( $\sim 11.2$  thousand) on the celestial sphere in the galactic coordinates, where maser lines was observed. The image is generated automatically on the project site.

## Features of the system

- **Search for maser data** by coordinates, source name or list of sources.
- Parallel data search in **popular astronomical catalogs from VizieR**.
- **Association of maser observations** with popular infrared and stellar catalogs - IRAS, 2MASS, UKIDSS, WISE, Akari, GCVS, etc. with instantaneous output of photometric and other data from these catalogs.
- **Cross-identification of masers in different lines** (H<sub>2</sub>O, OH, SiO). The possibility of identifying objects in which emission is present in several maser lines.
- **Ability to download observational data** in the form of tables in CSV format.
- **Detailed research of each object** in the database using images in different spectral ranges (from optical to radio).
- For some observations (~ 3.2 thousand) there are **spectra themselves**, which can be viewed and analyzed directly in the system.
- **Statistical analysis of data** - the construction of color-color diagrams, longitude-velocity, histograms of the spatial distribution of masers, etc.

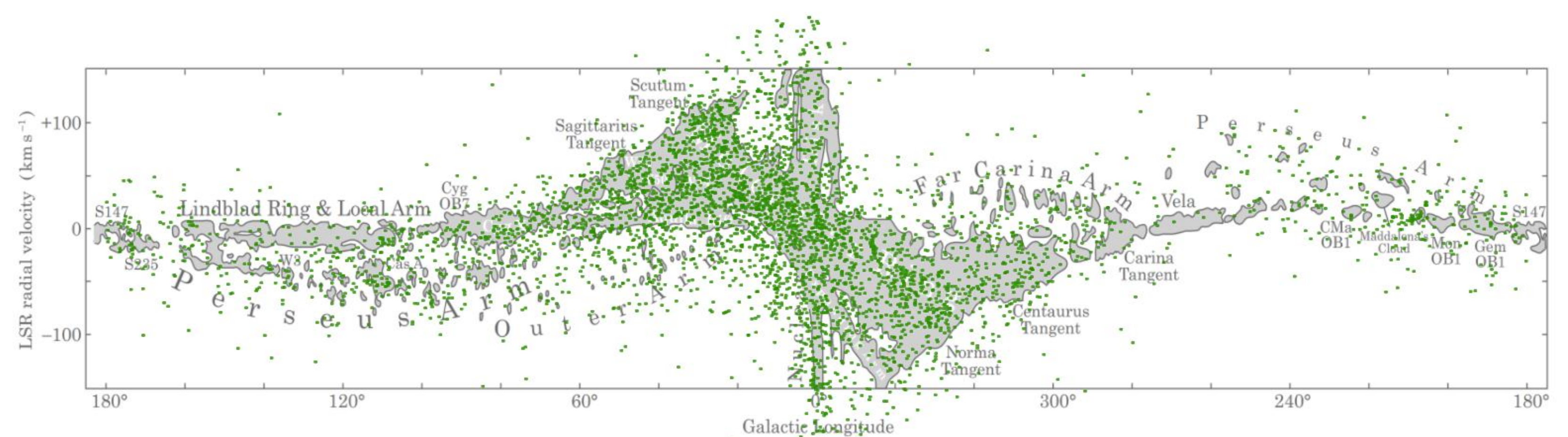
## Collected data

As part of the work on the **eDAMS** project (extensive Database of Astrophysical Maser Sources), the following data were collected in the database (~ 200 articles):

- H<sub>2</sub>O masers - 7 thousand observations in 4.0 thousand objects with the detection of emission in 1.6 thousand objects.
- OH masers - 14.5 thousand observations in 6.6 thousand objects with emission detection in 2.6 thousand objects.
- SiO masers - 9.5 thousand observations in 4.1 thousand objects with detection of emission in 2.2 thousand objects.

**Total - 31 thousand observations in 11.2 thousand objects with detection of emission (H2O or OH or SiO) in 5.2 thousand objects.**

The work utilizes the published database of OH masers from Engels & Bunzel (2015), an unpublished database of masers in various lines of the SiO molecule from the Nobeyama observatory (Japan), as well as data from single articles on maser observations.



**Figure 2.** The position of objects ( $\sim 5.2$  thousand) with positive registration of masers (H<sub>2</sub>O or OH or SiO) in the diagram radial velocity - galactic longitude. The image is generated automatically on the project site.

## Interface Features

[illegible]

**Conclusion:** The maserdb system is a convenient tool for obtaining new scientific conclusions from already accumulated data.