

# ASCL

## Astrophysics Source Code Library

**Peter Teuben, Chair**  
ASCL Advisory Committee

Also in the audience: **Alice Allen, Robert Hanisch**

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Library of Congress, Washington DC



<http://ascl.net>

# Take Home Points

- ASCL is a registry of 600+ (and growing) codes used in published astrophysics research
- Inspectable code, enabling reproducibility, verifyability and transparency of research.
- Cross-indexed into ADS (online literature search)
- Various ideas how to grow and be more useful to just astronomers
- Unfunded (volunteer work)



# THE ASTROPHYSICAL JOURNAL

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ASTRONOMICAL PHYSICS

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## ON THE CLUSTERING TENDENCIES AMONG THE NEBULAE

### II. A STUDY OF ENCOUNTERS BETWEEN LABORATORY MODELS OF STELLAR SYSTEMS BY A NEW INTEGRATION PROCEDURE

ERIK HOLMBERG

#### ABSTRACT

In a previous paper<sup>1</sup> the writer discussed the possibility of explaining the observed clustering effects among extragalactic nebulae as a result of captures. The present investigation deals with the important problem of whether the loss of energy resulting from the tidal disturbances at a close encounter between two nebulae is large enough to effect a capture. The tidal deformations of two models of stellar systems, passing each other at a small distance, are studied by reconstructing, piece by piece, the orbits described by the individual mass elements. The difficulty of integrating the total gravitational force acting upon a certain element at a certain point of time is solved by replacing gravitation by light. The mass elements are represented by light-bulbs, the candle power being proportional to mass, and the total light is measured by a photocell (Fig. 1). The nebulae are assumed to have a flattened shape, and each is represented by 37 light-bulbs. It is found that the tidal deformations cause an increase in the attraction between the two objects, the increase reaching its maximum value when the nebulae are separating, i.e., after the passage. The resulting loss of energy (Fig. 6) is comparatively large and may, in favorable cases, effect a capture. The spiral arms developing during the encounter (Figs. 4) represent an interesting by-product of the investigation. The direction of the arms depends on the direction of rotation of the nebulae with respect to the direction of their space motions.

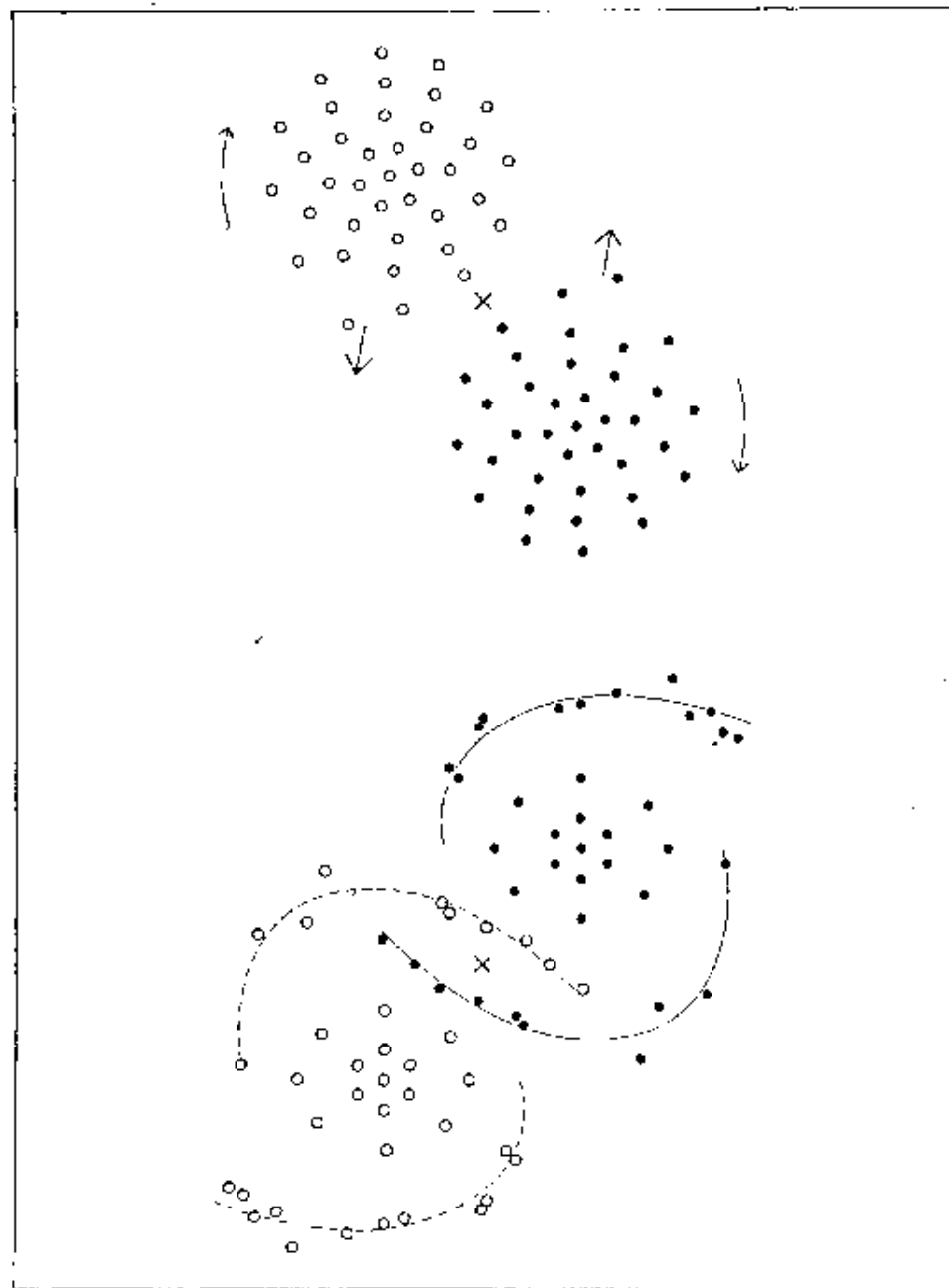


FIG. 4a

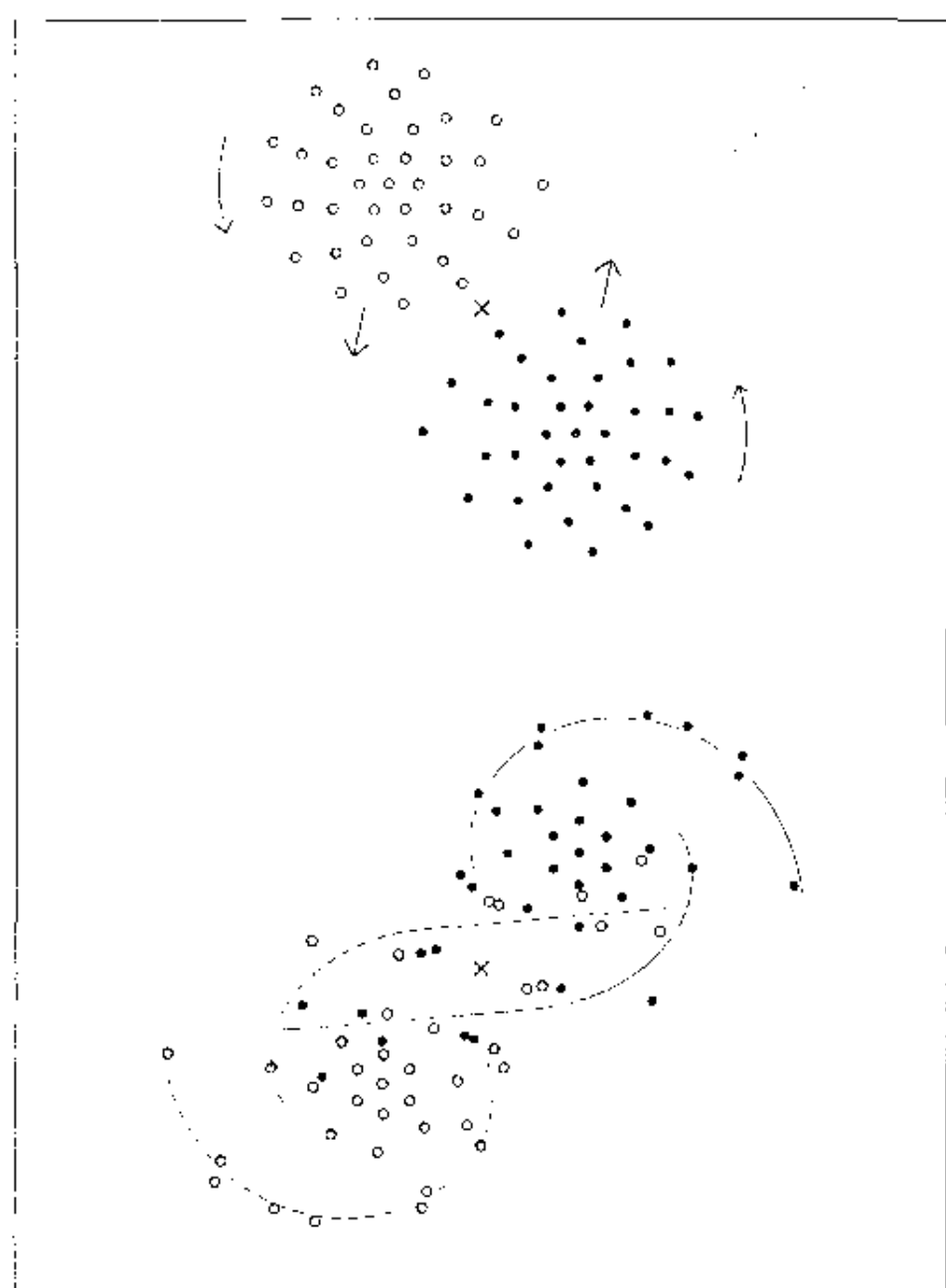


FIG. 4b

FIG. 4a.—Tidal deformations corresponding to parabolic motions, clockwise rotations, and a distance of closest approach equal to the diameters of the nebulae. The spiral arms point in the direction of the rotation.

FIG. 4b.—Same as above, with the exception of counterclockwise rotations. The spiral arms point in the direction opposite to the rotation.

The laboratory work was performed at the Lund University Observatory. The author wishes to express his sincere thanks to Dr. Knut Lundmark for generous economic support in procuring and constructing the experimental equipment. The author also expresses his gratitude to the Luma Factory of Stockholm for valuable help in designing and manufacturing **the special light-bulbs** that were used in the present investigation.

JULY 1941



## Organizations

IAU  
AAS  
WGAS → ADASS

## PAPER

ADS  
Arxiv.org  
(astro-ph)

## DATA

"VO"  
IVOA

## CODE

ASCL

# Current state in Astronomy



# Acronyms

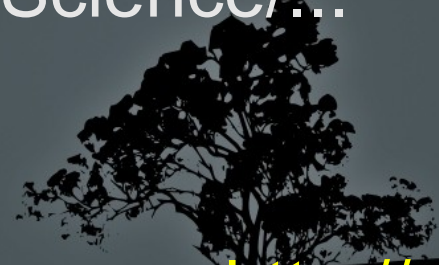
- IAU = International Astronomical Union
- AAS = American Astronomical Society
- WGAS = Working Group on Astronomical Software
- ADASS = Astronomy Data Analysis Software Systems
- ADS = Astrophysics Data System
- VO = Virtual Observatory
- IVOA = International Virtual Observatory Alliance
- DOI = Digital Object Identifier





# now: ASCL (v2)

- Several precursors (incl. ASCL v1) since 1980s
  - ASCL v1 in 1991, ASCL v2 in 2010
- 600+ codes, steadily increasing
- Presented/discussed in peer reviewed papers
- Included in ADS (citation index!) since Jan 2012
  - Each code unique ID+url (ascl.net/1305.002)
- Blog, Facebook, Google+, Starship Asterisk forum
- BoF / Focus Demo at ADASS/AAS/eScience/...
- Unfunded!





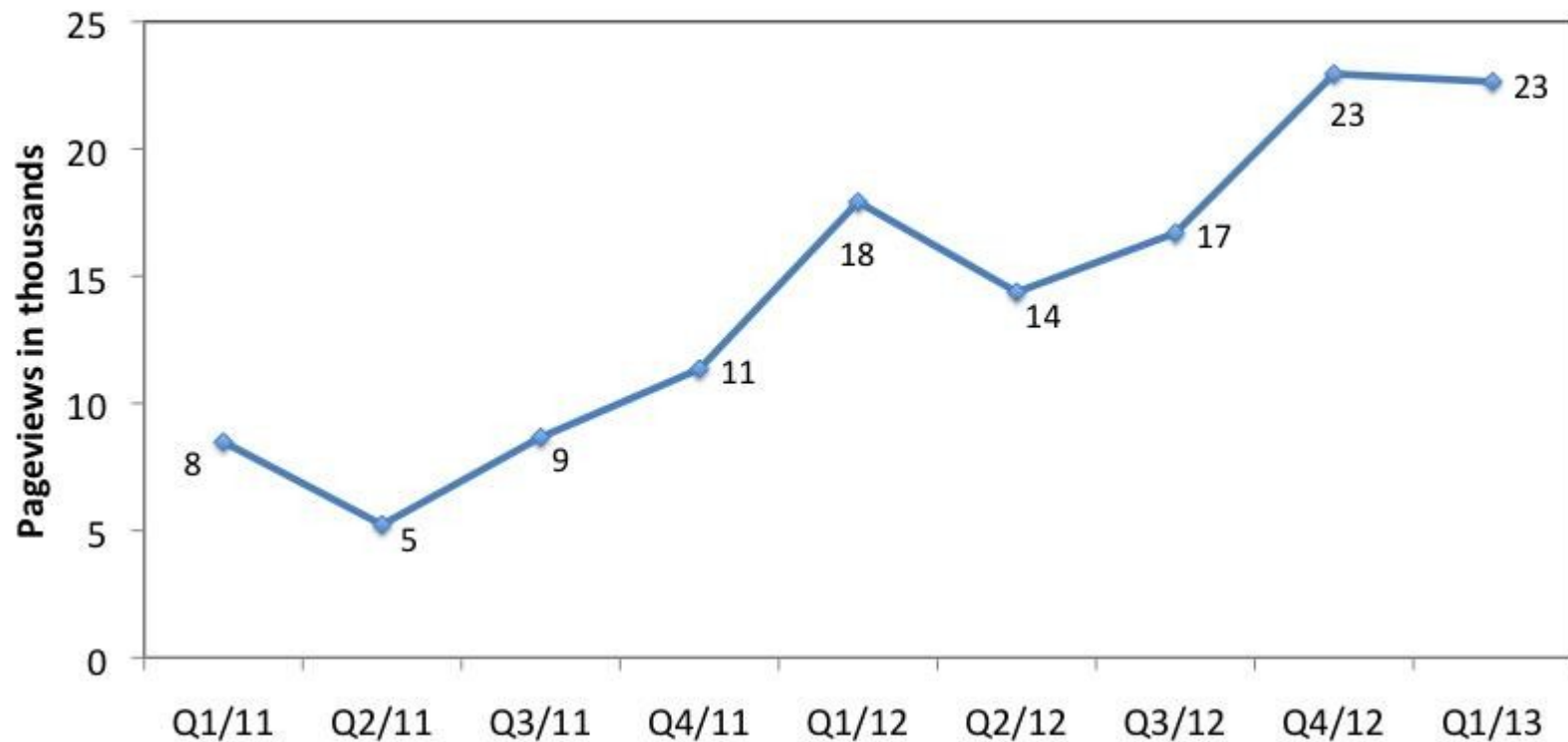
# ASCL growth since restart

**Total Number of Code Entries by Quarter  
July, 2010 - March, 2013**




# Use of ASCL over time


Pageviews by Quarter (in Thousands), 2011 - 1Q, 2013  
from Google Analytics



# Impact on the Community

- Coders requesting (or doing it themselves) to have their code included
  - Authors adding section or appendix to paper to have their code included
  - Papers citing codes explicitly
  - ASCL entries in CVs and Google Scholar
  - ASCL listed in code documentation
  - ASCL index in annual ADASS proceedings
- 

# future: ASCL (v3)

- Tighter integration with ADS? (DOI?)
    - Journals require code release (Lior et al. 2013)
    - Automatically find the code
    - Require "**Codes:**" next to "**Facilities:**" in papers
  - Better database (currently phpBB)
    - Code geneology
    - Code index (cf. Google Code)      ?code tags?
    - Better search
  - Archive the codes?
    - Testing (VM) centers, cf. *sourceforge*
  - Testbed for CS/SE/iSchool research
- 

# Facilities: + Codes:

- Journals are now accepting a "Facilities:" list, usually between Acknowledgements and References. Codes: seems a natural extension. E.g.:
  - Facilities: VLA, Spitzer (MIPS)
  - Codes: Athena, FLASH V1.6



# ”google” the code

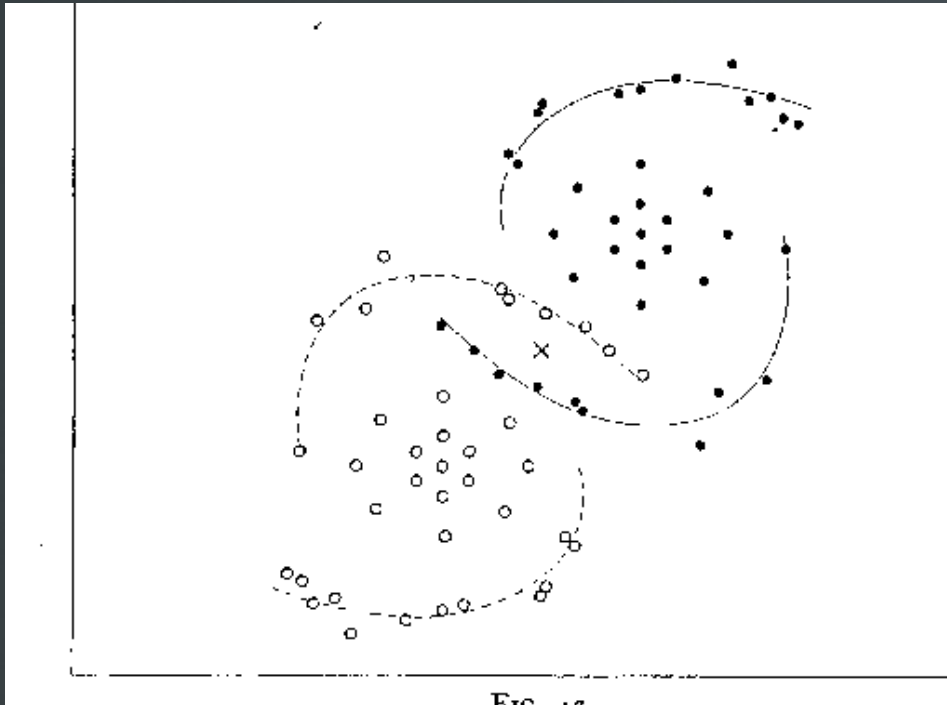
- 'google code' was terminated by google
  - Too useful?
- Search for:
  - Algorithms
  - Implementations / Languages
  - Authorship
  - Software Engineering practices?





# Preservation?

- Rerun software on older hardware?
  - Re-run with the bug, or fix the bug?





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