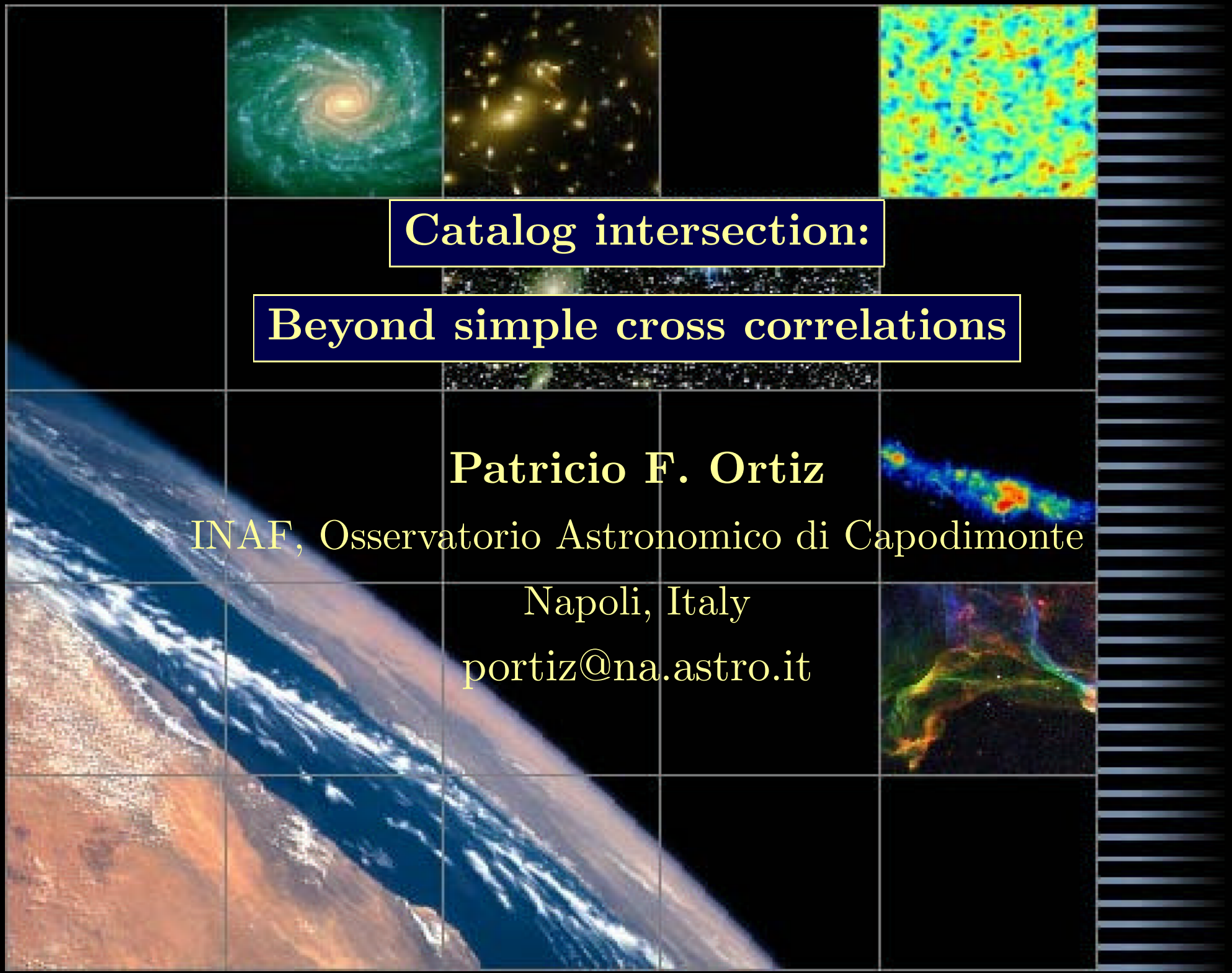

Catalog intersection:

Beyond simple cross correlations

Patricio F. Ortiz

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Summary

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Matching elements which are located close in the sky is a common first step.

In order to provide this functionality efficiently it is common that the database system handling the catalogue supports some sort of double parameter indexation scheme, eg, in (α, δ)

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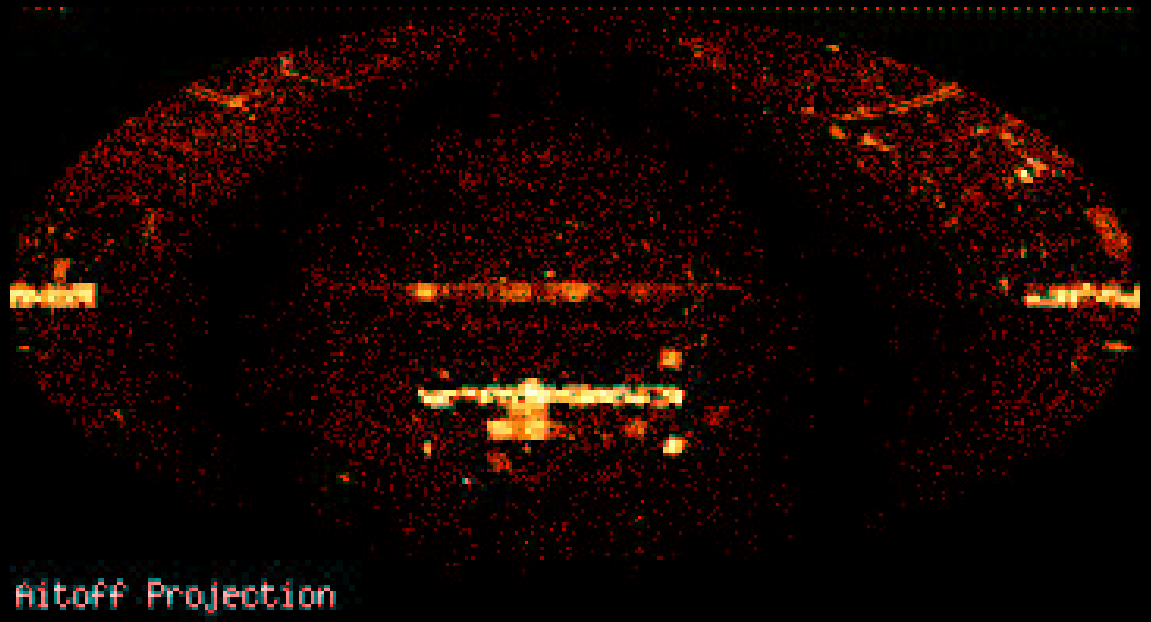

From Veron et al. 2001, List of known QSO's

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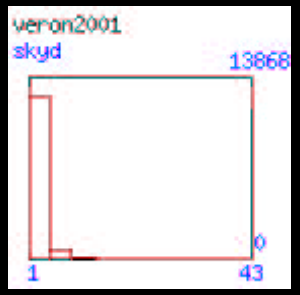
Find and list the areas of the sky where the source density falls in a given range.



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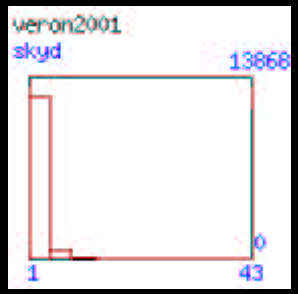

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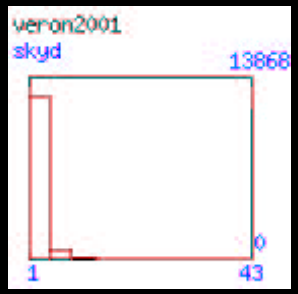

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The type of scientific questions to answer depends on the nature of the catalogue itself.

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In addition, comparison of these properties should be available.

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- *Find the lowest density areas amongst cats A, B, C, and D* Looking for a deep field pointing?
- *Look for the densest areas of Cat A and the lowest density areas of Cat B.* Looking for good extragalactic fields?

How to solve this problem?

12	8	67	99	14	43
28	79	135	170	159	82
100	125	75	10	5	5
54	15	0	150	27	89

1	1	1	1	1	1
1	1	1	1	1	1
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At a 30' x 30' ~ 165200 of these tiles is needed; the database uses it to speed up positional cross correlations.

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Global positional comparison of remotely located catalogues can be sped up by just comparing their positional indexes before touching individual elements.

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- Exploiting sky-coverage properties of catalogues on an individual basis should provide astronomers with a very powerful discovery tool.
- Extending these tools to combinations of catalogues should enable us to address a number of new questions and in particular, provide a better way to exploit archived data.