# Looking for building blocks of the Galactic Halo: Variable stars in the Fornax, Bootes I, Canes Venatici II dwarfs and in NGC2419


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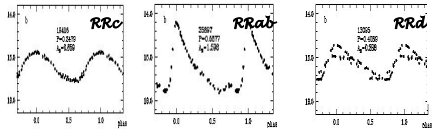
*Some results from my Ph-D thesis , done in Bologna under the supervision of Gisella Clementini (INAF- Bologna), in collaboration with E.V. Held (INAF- Padova), E. Poretti (INAF- Brera), M. Catelan (PUC) , L. Federici (INAF- Bologna), M. Maio(INAF- Bologna), M. Gullieuszik (INAF - Padova), V. Ripepi (INAF- Naples), M. Dall'Ora (INAF- Naples), Di Fabrizio (INAF- La Palma), K. Kinemuchi (U. de Concepcion/ Florida U.), M. Di Crescienzo (INAF - Roma),M. Marconi (INAF- Naples), I. Musella (INAF-Naples), B.Pritzl (UW Oshkosh), A. Rest (CfA, Harvard), N. De Lee (Florida U.) and H .Smith (MSU)*


**Why RR Lyrae stars?**

*Old population pulsating variable stars -- such as RR Lyrae stars - -are eyewitnesses of the Galactic Halo formation. They have been found in every old system , so it's possible to compare the RR Lyrae properties in many different environments.*

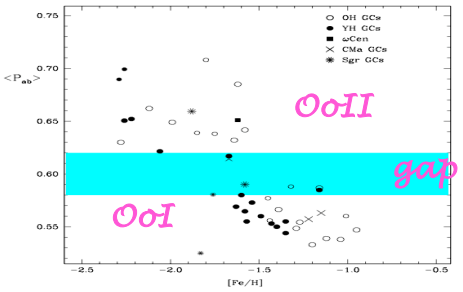
*Do the pulsation properties of RR Lyrae stars in systems outside the Milky Way conform to the properties of the Galactic RR Lyrae variables?*

*If they do not, the Galaxy's halo cannot have been assembled by protogalactic fragments resembling those systems.*




*Example light curves of different RR Lyrae types.*

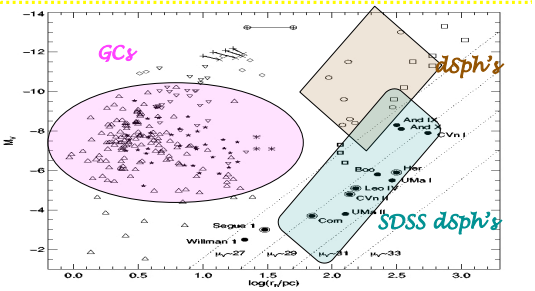
**Oosterhoff Dichotomy:**
*Galactic globular clusters show the so-called Oosterhoff dicothomy: a sharp subdivision into two distinct types according to the mean period of their fundamental-mode RR Lyrae stars: OoI : <Pab>=0.55 d, OoII<Pab>=0.65d.*




*Oosterhoff plot showing the mean value of the period for ab-type RR Lyrae stars vs metallicity relationfor Galactic globular clusters*

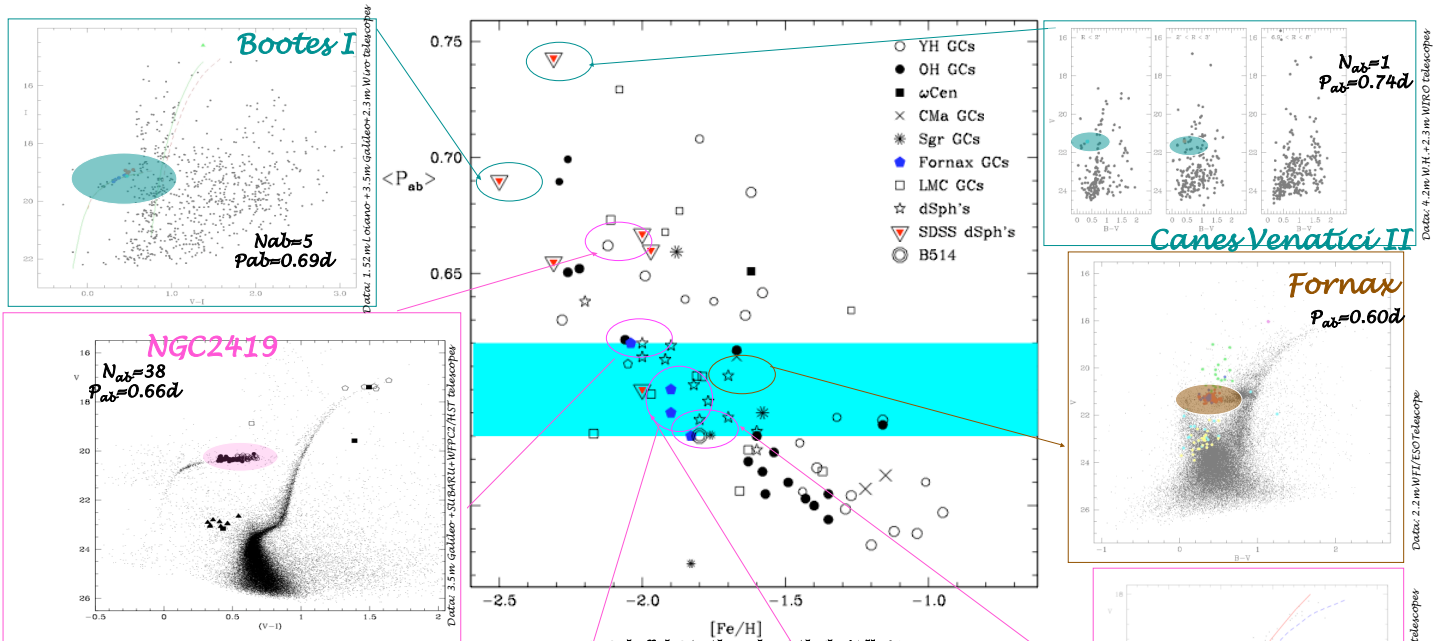
*Looking for the building blocks of the Galactic Halo* ***we investigated and compared the properties of the RR Lyrae stars in a number of different stellar systems inside and outside the Milky Way:***

*-Globular Clusters (GCs)*
*-Dwarf Spheroidal Galaxies (dSph's)*
*-Dwarf galaxies newly discovered by the SDSS*

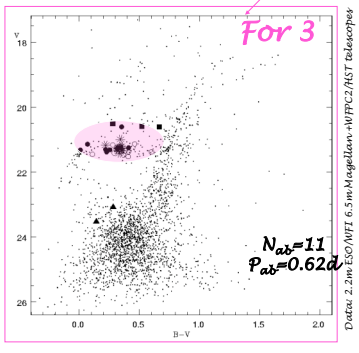


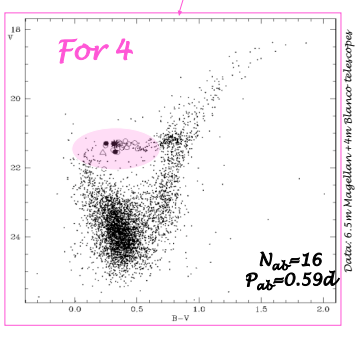

*Half - light radius vs V magnitude diagram for different stellar systems, possible "building blocks" of larger galaxies.*

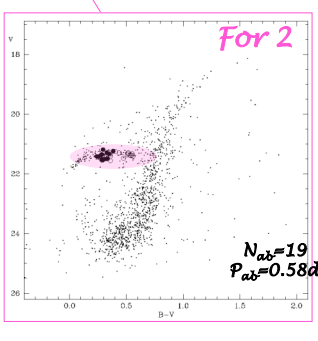
## What happens outside the Milky Way?




*Oosterhoff plot inside and outside the Milky Way. Cirles and arrows show the systems studied in this work. For each of them the Color-Magnitude Diagrams are shown along with the RR Lyrae loci. Magenta, brown and turquoise-blue colors refer to GCs, dSph's and SDSS dSph's, respectively.*




| Stellar System | $N_{ab}$ | $\langle P_{ab} \rangle^*$ | *Oosterhoff type* |
|---|---|---|---|
| For dSph | - | 0.60 | Oo int |
| For 2 | 19 | 0.58 | Oo int |
| For 3 | 11 | 0.62 | Oo int |
| For 4 | 16 | 0.59 | Oo int |
| For 5 | 15 | 0.59 | Oo int |
| Boo I | 5 | 0.69 | Oo II |
| CVn II | 1 | 0.74 | Oo II |
| NGC2419 | 38 | 0.66 | Oo II |

* Average periods of ab-RR Lyrae stars in days.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