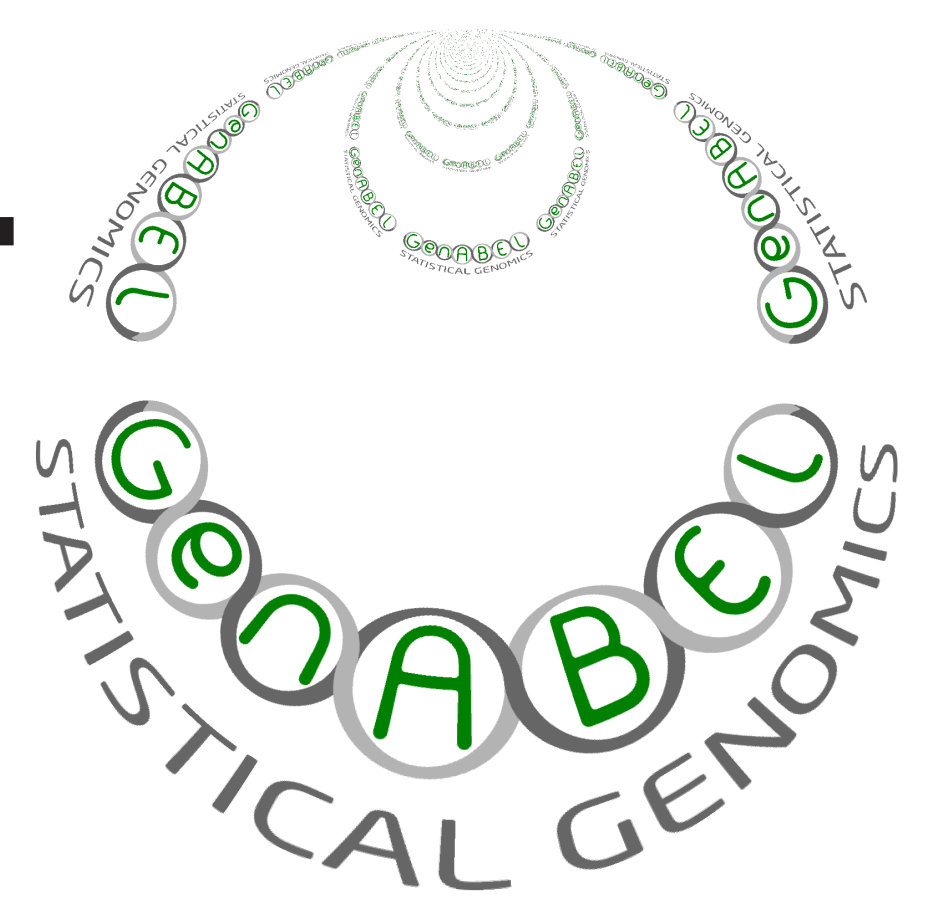


New software and developments in the GenABEL project



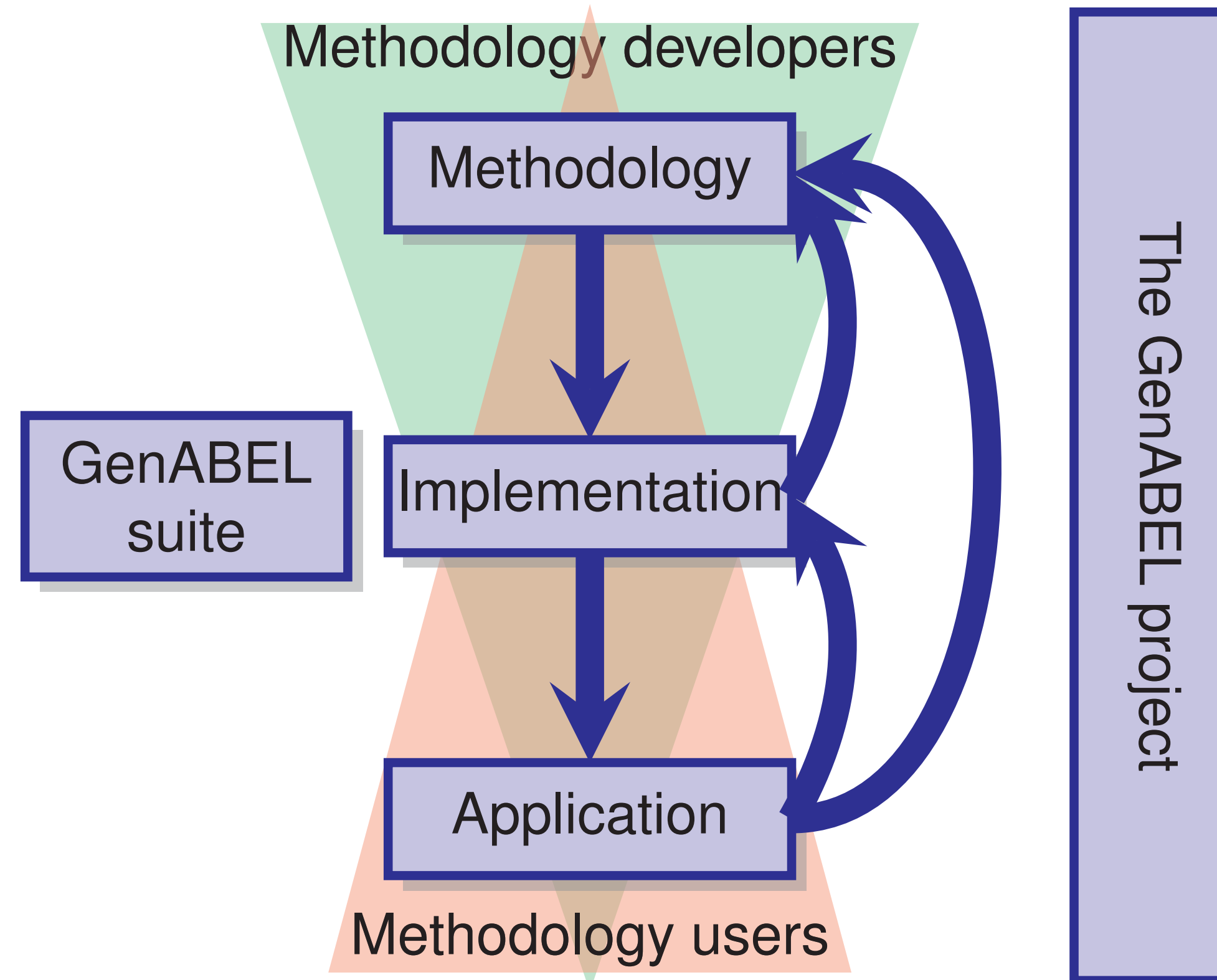
L.C. Karssen^{1,*}, on behalf of the GenABEL developers

¹YuriiA Consulting, Groningen, NL *l.c.karssen@gmail.com

The GenABEL project for statistical genomics

Our mission:

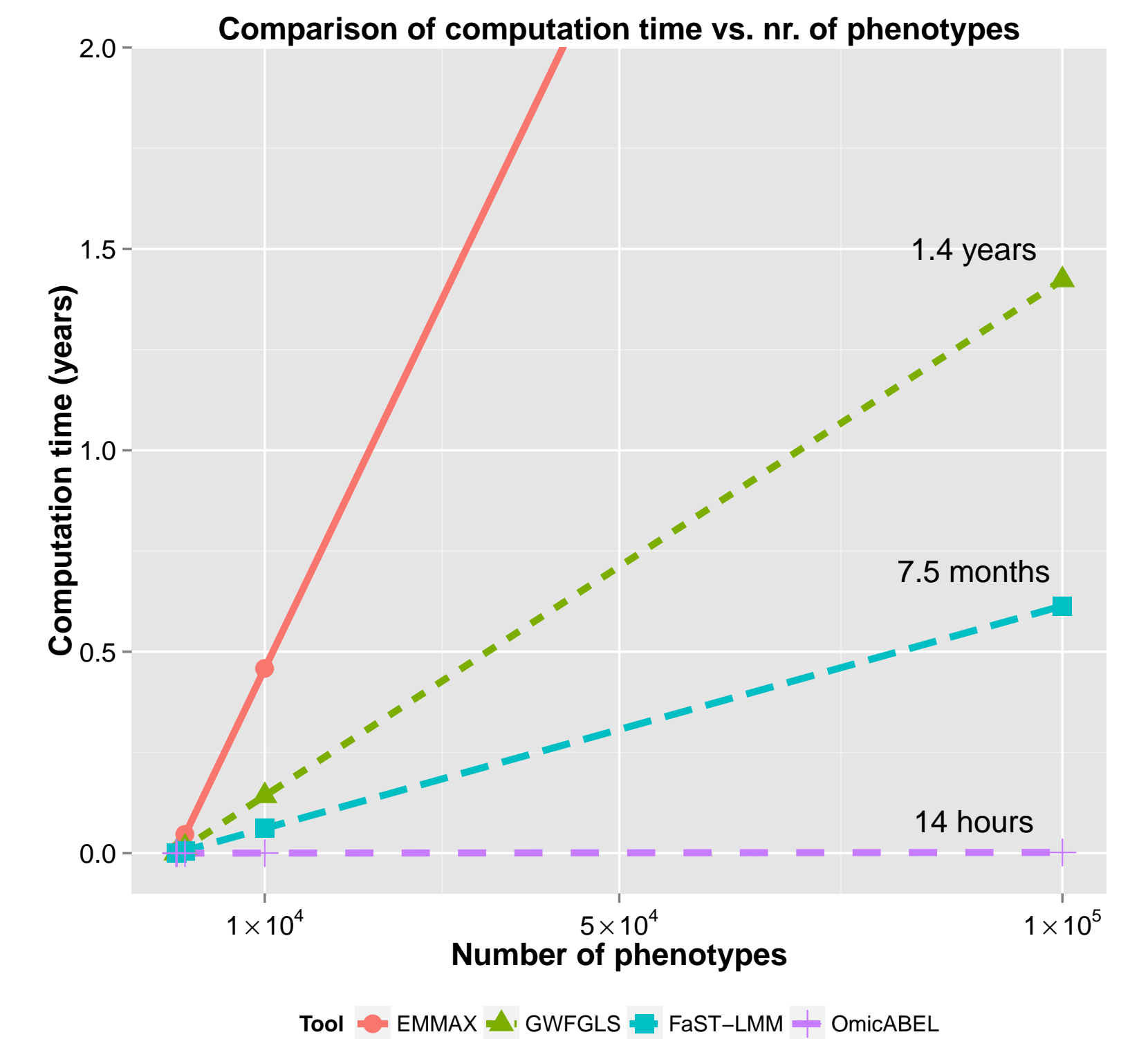
- Provide a free and open framework for development of **statistical genomics methodology**.
- Develop and maintain free and open-source implementations of these methodologies: **the GenABEL suite**.
- **Dissemination** of these methods and software.
- Foster **collaboration** between methodology developers, software developers and end users.



New additions and updates

Recent improvements to the GenABEL suite and project:

- **OmicABEL**: extremely fast mixed-model based GWAS analysis of many phenotypes (e.g. metabolomics, glycomics)



- **Papers published**: Tsepilov 2013^[1] and Belonogova 2013^[2]

- ProbABEL packaged for:

- **Debian** (.deb), included in “testing” and “unstable”.
- **Ubuntu** (.deb), using a Personal Package Archive (PPA).
- More packages will follow, as well as .rpm packages.

- **Improved software development**: Use the Jenkins Continuous Integration server to monitor stability and quality of the code.

- The **GenABEL tutorial** has been made fully open source.

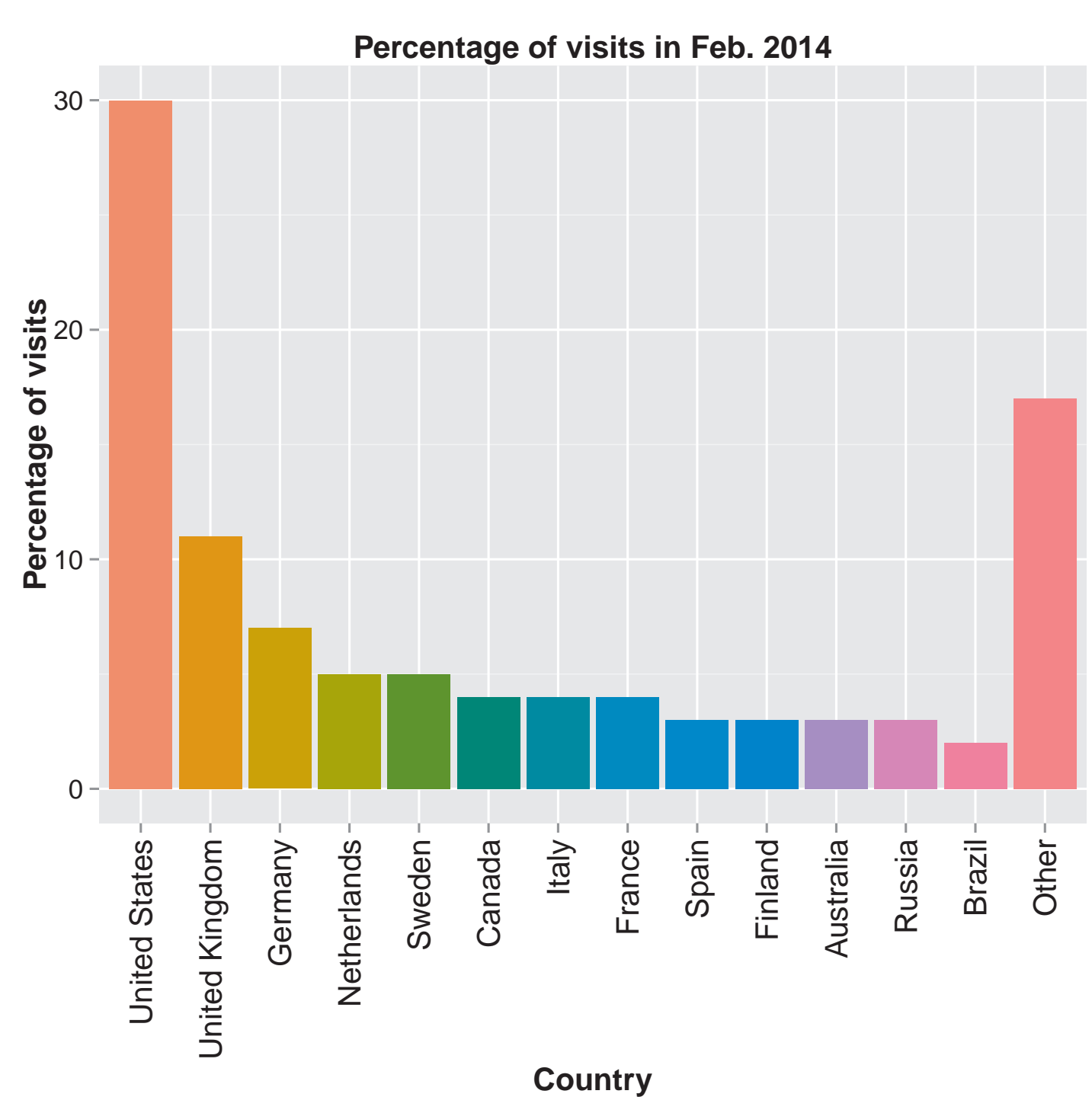
- **New package releases in 2014**:

- **ProbABEL**: v0.4.3
- **GenABEL**: v1.8-0
- **MetABEL**: v0.2-0
- **VariABEL**: v0.9-2

Packages in the GenABEL suite

- **GenABEL**^[3] core (2007), **ProbABEL**^[4] (2009) and **MixABEL** (2010); for flexible analysis of genome-wide association studies (GWAS)
- **MetABEL** (2009), for meta-analysis of GWAS results
- **VariABEL**^[5] (2011), genome-wide search of interacting loci
- **PredictABEL**^[6] (2011) facilitates evaluation of genomic prediction models
- **ParallABEL**^[7] (2010), for parallelization of GWA analyses
- **DatABEL** (2010), a library for management of very large files
- **OmicABEL** (2013), extremely fast analysis of omics traits (omics GWAS), see Figure

Web site statistics



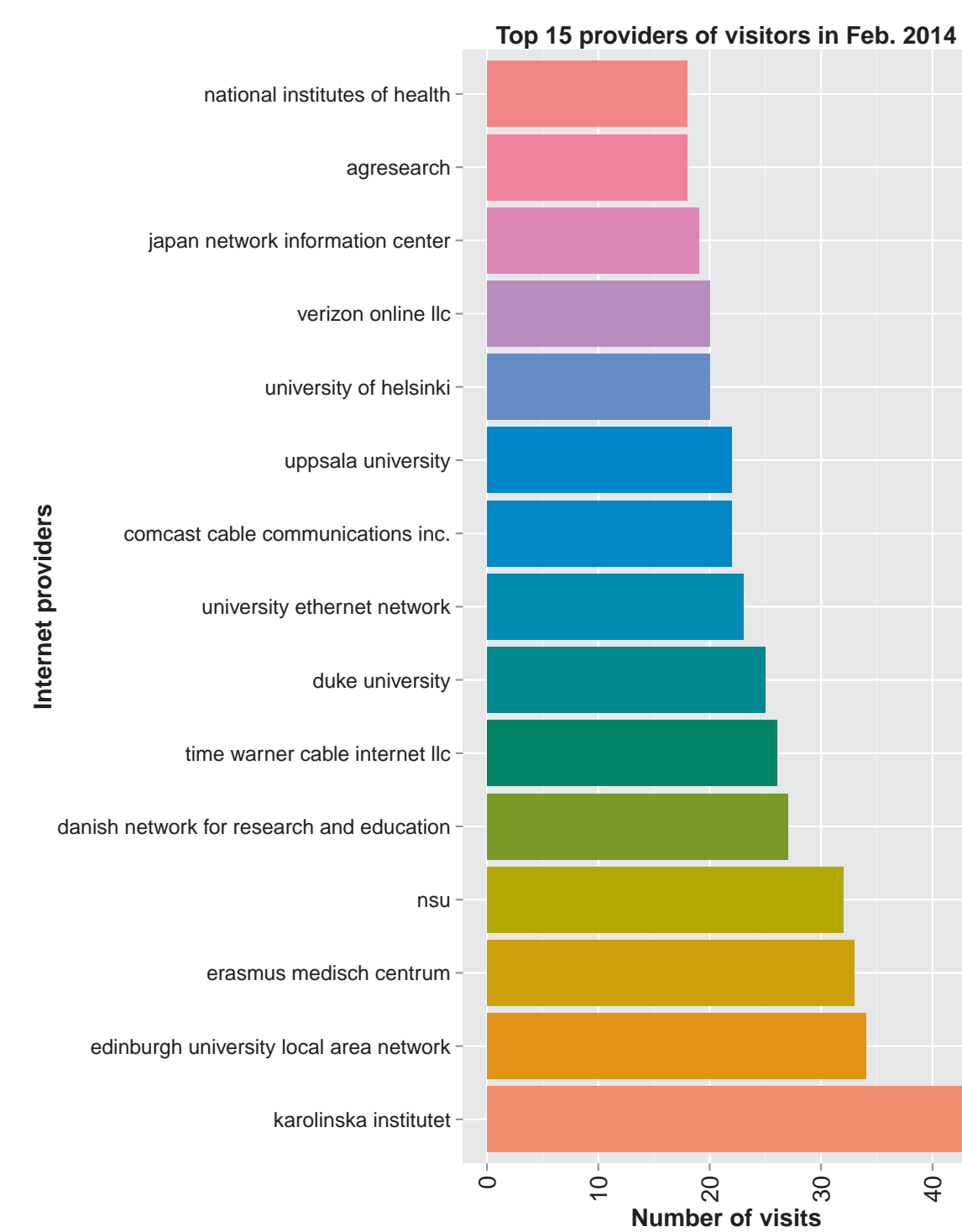
- Web site views in Feb 2014: **2295**

- Web site views since Jan 1st, 2011: **69 464**

- Total nr. of forum users since Jan 1st, 2011: **479**

- Total nr. of forum posts since Jan 1st, 2011: **1213**

- Number of downloads of the ProbABEL package from the Ubuntu PPA: **110**



How to contribute?

We welcome **all sorts of contributions**:

- Answer questions on the forum
- Add/correct the documentation
- Graphics and/or web design
- Report and/or fix bugs
- Creating .deb or .rpm packages
- Help maintaining packages
- Write new packages
- Financial support/feature on request

Plans for the near future

- **OmicABEL**:
 - Improved user-friendliness
 - More efficient storage of output data
 - Release of a non-mixed-model version of OmicABEL
- **ProbABEL**:
 - Speed up of analyses
 - Support for *p*-values in output
 - Support for reading and writing zipped files

References

- [1] Y. A. Tsepilov *et al.* *Development and application of genomic control methods for genome-wide association studies using non-additive models.* PLoS One, **8**: e81431, 2013.
- [2] N. M. Belonogova *et al.* *Region-based association analysis of human quantitative traits in related individuals.* PLoS One, **8**: e65395, 2013.
- [3] Y. S. Aulchenko *et al.* *GenABEL: an R library for genome-wide association analysis.* Bioinformatics, **23**: 1294–1296, 2007.
- [4] Y. S. Aulchenko *et al.* *ProbABEL package for genome-wide association analysis of imputed data.* BMC Bioinformatics, **11**: 134, 2010.
- [5] M. V. Struchalin *et al.* *Variance heterogeneity analysis for detection of potentially interacting genetic loci: method and its limitations.* BMC Genet, **11**: 92, 2010.
- [6] S. Kundu *et al.* *PredictABEL: an R package for the assessment of risk prediction models.* Eur J Epidemiol, 2011.
- [7] U. Sangket *et al.* *ParallABEL: an R library for generalized parallelization of genome-wide association studies.* BMC Bioinformatics, **11**: 217, 2010.

URLs

- **Home page**: <http://www.genabel.org>
- **Support forum**: <http://forum.genabel.org>
- **Development**: GenABEL @ <http://r-forge.r-project.org>

Financial support

- Erasmus MC, Rotterdam, NL
- YuriiA Consulting, Groningen, NL
- MIMOmics (EU FP7 project)
- **New sponsors needed** since we have no dedicated funding!