New Opportunities with julia|Quantum⟩ – personal perspective for quantum information

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MEETUP – 2015-12

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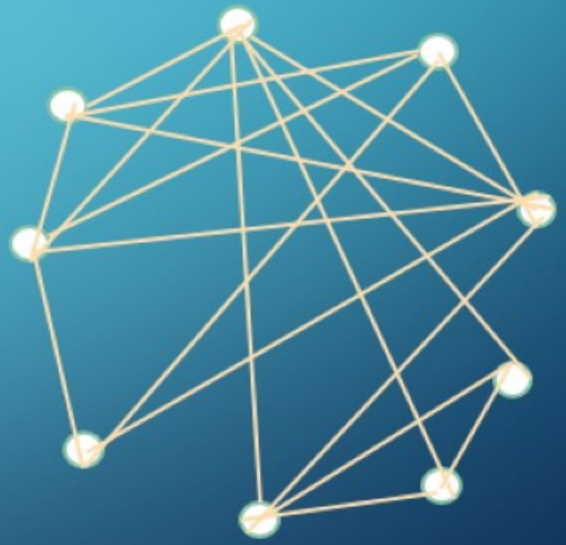
互联网启示录
ALL BEGINS WITH INTERNET

马特·德拉吉的故事 Story of Matt Drudge 1998.1



JuliaQuantum: 与人为善

JuliaQuantum: commit things with people for good.

QuDynamics.jl项目
THE QuDynamics.jl PROJECT

2014-12: 开始召集量子动力学程序包 Call for dynamics solvers

2015-02: 接收到一些零散的支持和新想法

Received a few love letters and new ideas

2015-03: 组建团队，计划通过内部讨论

Team established, plan accepted by JuliaQuantum team.

2015-04: 谷歌暑期编程2015项目提案获批并获得资助

GSoC2015 Proposal completed and funded

2015-08: 项目完成，QuDynamics.jl框架搭建完成

GSoC2015 project completed (QuDynamics.jl)

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QuDynamics.jl项目
THE QuDynamics.jl PROJECT

一般的流程模式

General workflow model

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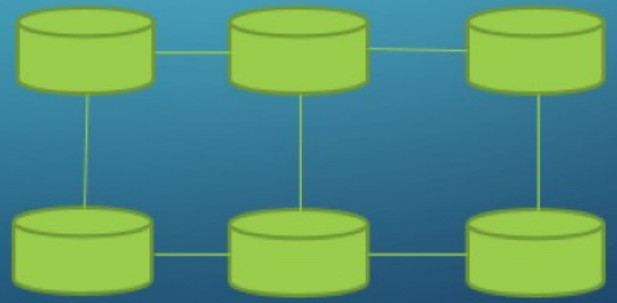
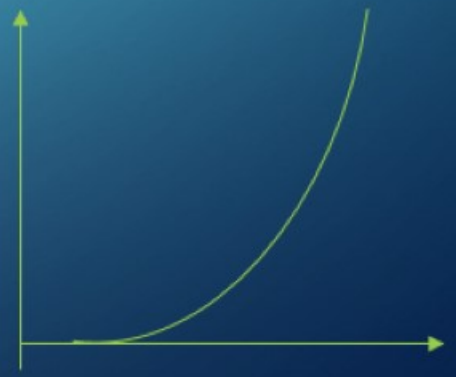
为什么选择Julia？
WHY Julia?

一个好的编程语言绝不仅仅是一个概念，它必然应很好的反映了计算机硬件的特点和人们的核心需求。

A good language is never merely a concept; rather it reflects well the utilities of hardware and fits people's core needs.





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JuliaQuantum在行动
JuliaQuantum IS RUNNING

USTC 2015 Meetup
Fudan 2015 Meetup
GSoC 2015
APS2015 meetup
SQuInT2015 workshop
Berkeley Meetup
Website development
Interact with the community
MIT 2014 visit
GitHub repositories
Numerous internal discussions
Recruits
Roadmap

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未来
Future

量子信息方面可能的项目：

Possible Projects for Quantum Information in Julia:

1. 量子信息及仿真程序库 Library for QI and QuSimulations

- 将QuBase.jl变得更抽象 QuBase.jl becomes more abstract
- 量子信息基本函数 basic functions for QI
- 量子第一性原理计算程序的接口 Interface to current first-principle simulation packages (http://lqcc.ustc.edu.cn/helx/software_cn.html is opening with the promised guidance from Prof. Lixin He and his team)
- 量子统计仿真 Q statistical simulations (*Katharine Hyatt's talk*)
- 量子线路仿真 Quantum Circuit Simulations (QuIDDPro etc.)

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未来
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量子信息方面可能的项目：

Possible Projects for Quantum Information in Julia：

2. 对量子计算机软件层的实验探索

Testing-bed for the software side of Quantum Computers

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例子：基于原子系统的量子信息处理

Example: Quantum Information Processing based on neutral atoms

自由空间 free-space

光子学结构 photonic structure

量子芯片 quantum chips

量子态制备，测量，操控，存储

Preparation, measurement, control and storage of quantum states

系统集成 Systematic integration

量子模拟，量子纠错 Quantum Simulations and Quantum error correction

Refs: Optics Communications 283 (2010) 681-694, arXiv:150902625

未来
Future

3. 超越Julia编程语言

Beyond Julia programming language:

- 编程语言抽象性 Programming abstract
- 超越图灵机的计算机语言 Language Beyond Turing Machine

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梦想
Dream

为大家创造机遇实现自己的美好梦想！

Create Opportunities to Help People to realize their beautiful dreams!

- 知识水平不分高低—社区将会提供尽可能的帮助。

  For anyone! – you don't have to know a lot, the community will help!

- 贡献不分大小—全都载入我们的记录。

  With any contributions – big or small, every effort counts.

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致谢
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