Kavli Institute
for Cosmological Physics
AT THE UNIVERSITY OF CHICAGO

New Fellows Orientation

October 3, 2016

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New Postdoc Orientation

- Welcome to the KICP!
- Who are we?

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Personnel

- Introductions
  - Michael Turner (Director)
  - John Carlstrom (Deputy Director)
  - Daniel Holz (co-Leader of the Fellows MA)
  - Erik Shirokoff (co-Leader of the Fellows MA)
  - Ted Ressell (Assistant Director)
  - Helen Pates (Business Manager)
  - Aimee Giles (Travel & Symposium Event Coordinator)
  - Kevin Patterson (Assistant to the Director)

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Personnel

- Valeri Galtsev (Sr. System Administrator)
- Elena Galtseva (Web Developer)
- Igor Yakushin (HPC Consultant)
- Randall Landsberg (Director of EO&D)

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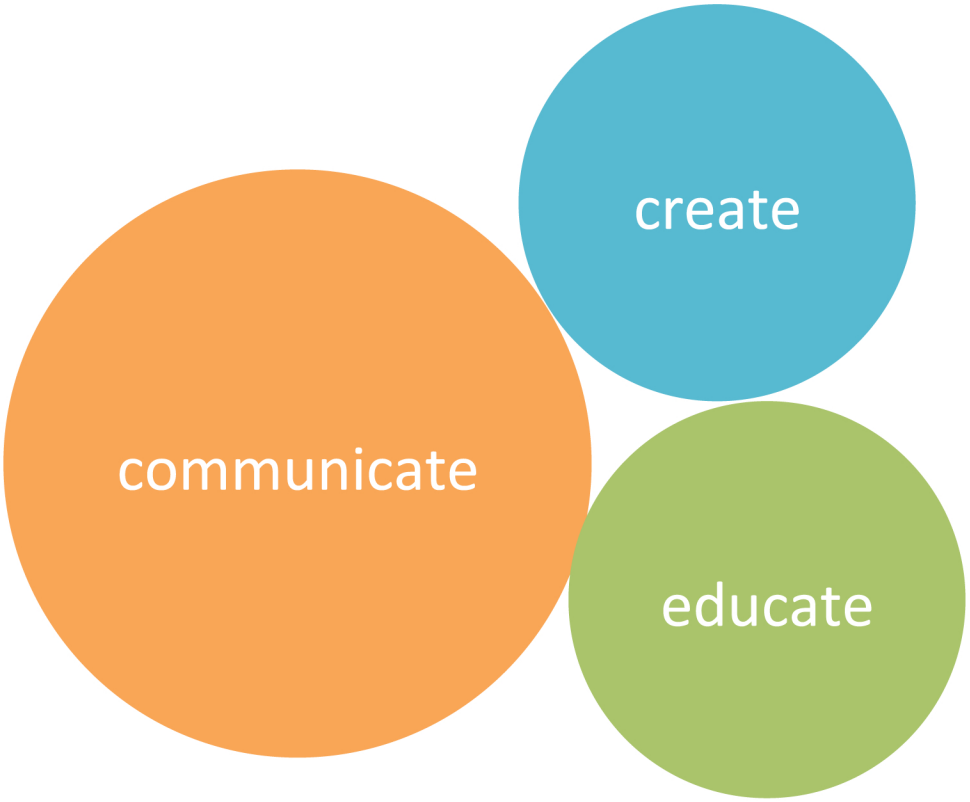
Personnel

- A few other people you will meet:
  - Val Smith (Assistant to John Carlstrom/SPT)
  - Mary Wawro (Financial Administrator)
  - Theresa Cook (Facilities Manager)
    - 4-8054

Outreach Opportunities



Randy Landsberg
Director Education & Outreach KICP

Culture of Education & Outreach/Science Communication

100% of KICP faculty [28]
96% of KICP Fellows (86% of all postdocs) [66]
55% of graduate students [30]
and over 100 scientists from beyond KICP
actively engaged.

KICP Signature Programs

Engaging underrepresented K-12 minorities in STEM	. ➤	Space Explorers
Teaching teachers Cosmology & providing tools to disseminate	. ➤	Cosmology Short Courses
Increasing public interest & excitement	. ➤	Museum/Art Institute Partnerships

Center Enabled E&O Opportunities

exploratorium® the museum of science, art and human perception

Maps

Chicago Sinfonietta

World Science Festival

Slacker Astronomy

Science Friday

BBC

The New York Times

WBEZ91.5

Great Lakes Planetarium Association

ASA American Society on Aging

California Academy of Sciences

Microsoft Research WorldWide Telescope

A·S·P·E·N Center for Physics

Communicate / Connect

American Museum of Natural History

Google

SAIC School of the Art Institute of Chicago

Advancing STEM Diversity: Space Explorers (high school)

- Multi-year with over 100 contact hours/year
  - Weekly 2-hr on-campus lab
  - Twice annual residential science institutes at Yerkes Observatory (3-day winter, 1-week summer)
  - Other activities (e.g., Adler, Fermilab, college tours)

- Impact (2011-2016)
  - **86** urban youth; average participation 3yr
    - 191 residencies at Yerkes Observatory
  - **69** high school graduates (100%)
    - 97% to college; 38% STEM majors (76% STEM for 12th grade participants)
  - **36** scientists/instructors
    - 19 grad students, 7 postdocs, 6 senior, 4 teachers
    - 84 residencies at Yerkes

Tutoring: M-TR 4:30-6:30PM, Sat 9-noon
Mentoring 1hr/month (Oct, Nov, Jan-May)
Yerkes Winter Institute Dec 27-29
- planning sessions start in November

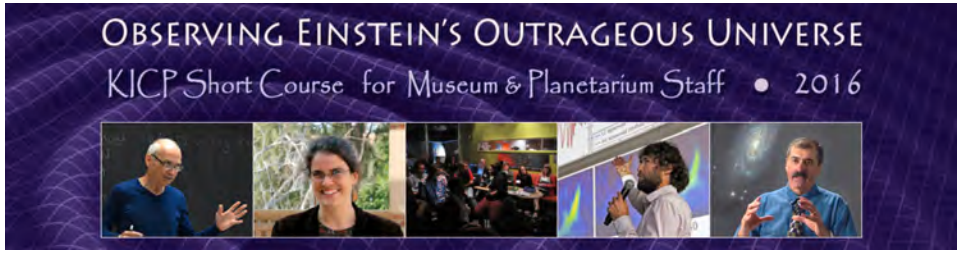
2016 Space Explorer Seniors

11 graduates participated though senior year (12th grade)

- 91% to College
- 73% plan STEM major
- Over two million in scholarships

Dziedzom Bansah	**Chemistry/Pediatrician**	University of Illinois-Chicago
Kevin Chung	**Bio/Math undecided**	Denison (Posse scholarship)
Luwam Dichma	International Studies	University of Illinois Springfield or Michigan State
Sonya Echols	Criminal Justice	Army
Tyree George	**Pre-Veterinary/Animal Science**	Hampton College
Natalie Jones	**Biochemistry - Dentistry**	University of Illinois Urbana Champaign
Richard Neals	**Mechanical Engineering**	Temple University
Ryan Nowells	undecided	Kennedy King College
Chanel Reid	**Biology - Nurse Practitioner**	Jackson State University
Austin Smith	**Physics**	The University of Arizona
Ericka Woods	**Economics**	Northwestern University

Increased Appreciation of Science: Short Courses for Museum & Planetarium Staff

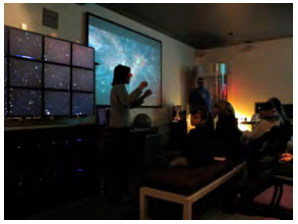


- Three 3-day Courses
  - Dark Matters (2012)
  - Evolving Universe (2014)
  - Observing Einstein's Outrageous Universe (2016)

- Engagement
  - 18 faculty, 5 fellows, 2 grads
  - 45 museums
  - 83 participants (100% would come again)

- Impacts/Amplification (1-year follow up surveys 2012 & '14 n=38, 63%)
  - **15** new shows/exhibits (+ many modified)
  - **59,167** students (66% under-represented)
  - **337,974** visitors (48% under-represented)
  - Impacts continue to grow

Increased Appreciation of Science: Museum Partnerships



Adler Planetarium & Astronomy Museum

- Exhibits & shows (e.g., May 5 Kavli dome-cast)
- Workshops, summer school, short courses, conferences
- Astronomy Conversations (Sept 2011 – April 2016)
  - 6 training sessions (bi-annual)
  - 64 presenters
  - over 1,000 presentations
  - over 79,000 visitors directly impacted

Training/Recruitment Tues. Oct. 11 4-6pm @ Adler

ADLER
PLANETARIUM

K-Grey Engagement : Life Long Learning (L3)

- Founded by NSF AAPF Fellow D. Grin
- Motivation
  - 20% of the US population over 65 by 2030
  - "*Use it or lose it*" is a clinical fact: Dementia rates are 50% lower for cognitively active retired older adults
  - Free learning, study, and exploration identified by MacArthur Foundation as essential components of "successful aging"
- Program
  - Speaker training w/ gerontologist & coaching
  - Interactive presentations
  - Field trips to Adler

- Results (2013 – 2016)
  - 9 sites (2 senior centers, 2 libraries, 5 residences)
  - 37 speakers (19 KICP)
  - 100 presentations + 6 field trips to Adler
  - 2,287 audience members

Gerontologist training/recruitment session
Thursday October 27 10am-noon

A few specific opportunities

SPACE EXPLORERS
Tutoring: M-TR 4:30-6:30PM, Sat 9-noon
Mentoring 1hr/month (Oct, Nov, Jan-May)
Yerkes Winter Institute Dec 27-29

- Planning sessions start in November

ASTRONOMY CONVERSATIONS
Training/Recruitment Tues. 10/11 4-6pm @ Adler

Education Outreach & Diversity Group Meeting – every other Fri.
Fri. 10/14 9:30AM guest Daniel Casasanto – Think Tank (neuroscience)

L3
Gerontologist Training/Recruitment Thursday 10/27 10am-noon
Volunteer to be a presenter

New Ideas

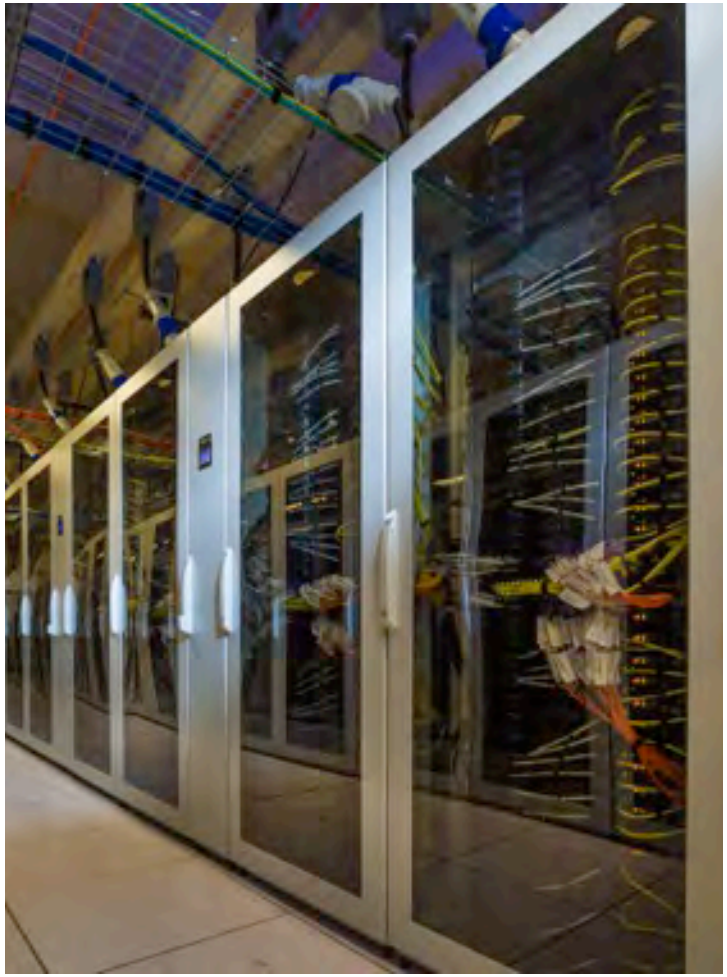
High Performance Computing

In 2011, a new Physics Frontier Center grant was awarded to the KICP, including Computational Cosmology as a “major activity.” At the same time, the University of Chicago formed the Research Computing Center to bring centrally managed computational resources and support to campus.

The KICP partnered with RCC to provide computing hardware, support and training to its members.

Midway general purpose cluster

- ~1000 compute nodes, ~16,000 cores
- Typical compute node: 2x8 core 2.6GHz Sandy Bridge Processors
  - 32GB memory
  - FDR10 (40Gb/s)
- Special purpose hardware
  - Large shared-memory nodes (256G - 1T ram)
  - GPU and PHI accelerator nodes
  - Hadoop cluster
  - Zar 3-d visualization lab
- High performance storage (~ 1.4P in /project)
  - Backed up to tape daily
  - Snapshots hourly, daily, weekly
  - Accessible via scp, Globus, smb mount
- Available to all UChicago researchers



6045 S. Kenwood
south of the Midway

We are expanding: **Midway 2.**

Hardware installed, currently testing and benchmarking

- 370 compute nodes
  - Intel Broadwell CPU, 2.4GHz
  - 28 cores
  - 64G
  - Half nodes with EDR (100Gb/s) and half with FDR (56Gb/s)
  - Scientific Linux 7.2 (vs SL 6.7 on midway)
- 6 nodes with 4 Tesla K80 GPU
- 6 big memory nodes (512G)
- 2 login nodes
- 18 loosely coupled nodes
- Storage:
  - share $HOME with midway 1,
  - separate /scratch and /project (~1.6P)

KICP Midway partner cluster

managed as an island within the larger cluster

- 31 infiniband nodes - useful for large distributed or I/O intensive tasks
- 4 ethernet nodes - reserved for serial or low-I/O tasks
- 50TB of capacity storage
  - 1TB quota per user, ask if you need more
  - 5TB scratch space per user (short term only!)
- ssh [cnetid]@midway.rcc.uchicago.edu
- http://docs.rcc.uchicago.edu/docs
- https://rcc.uchicago.edu/docs/tutorials/intro-to-rcc-KICP.html
- Tickets: kicp@rcc.uchicago.edu

XSEDE – e**X**treme **S**cientific and **E**ngineering **D**iscovery **E**nvironment

- If the local computational facilities are not enough, consider using XSEDE
- NSF funded, ~12 cluster around the US
- http://www.xsede.org
- MPI, Intel Phi, GPU, Hadoop, VMs, etc
- Free but one needs to apply for allocation as for grant
- I am local XSEDE Campus Champion if you have further questions

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THE UNIVERSITY OF CHICAGO | Research Computing Center

Computational Scientist

my job is to …

- Maintain KICP Midway software environment, tools, and documentation
- Provide general computing advice
  - code development and design
  - debugging, parallelization, and optimization
  - visualization and analysis
- Help educate KICP members in HPC
  - RCC workshop schedule http://rcc.uchicago.edu/services/training.html
  - XSEDE related questions

Available most Thursdays and Fridays at ERC #413, or email to schedule meeting

Igor Yakushin

ERC #413,

RCC #2

773-834-5313

ivy2@uchicago.edu

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Jamboree

- Tomorrow (Tues, the 4th), 1:30 – 4:00
  - Don't forget to prepare your 1 slide and 60 second presentation and send it to Ted, today!
- Welcome BBQ to follow 4:00 – 6:00
  - Families welcome

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Mentoring

- Mentoring Program
  - All Fellows receive a Mentor
    - Should meet 2-4 times per year
    - Not a likely research partner
  - Brief Annual report due each year
  - Mentoring is a unique opportunity, take advantage of it!

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Career Assistance

- Fellows Career Forum
  - Informal discussions on topics relevant to Postdocs
  - Always looking for topic suggestions
- Broader Horizon lectures

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Fellows Career Forum

- We need topics and encourage suggestions!
- Ideas from the proposal:
  - Strategies for applying for jobs
  - Dealing with the Press
  - Career opportunities within and beyond academia
    - Look for Broader Horizon Lectures
  - Writing Grant Proposals

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Fellows Career Forum

- Options for dual-career partners
- Balancing family and career
- Mentoring students
- Skill development (e.g. Python tutorial)

- Frequency
  - Once, occasionally twice, a quarter

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Friday Seminars

- Friday Seminar Committee
  - Run by 2nd year Fellows
  - Organize Postdoc Symposia
  - 1st year Fellows keep an eye on what the current committee is doing to make it easy on yourselves!

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Group Meetings

- There are many research group meetings occurring every week.
- All new Fellows are encouraged to attend a variety of these in their first few months here to get a taste for all of the activities occurring at the KICP.
- Current Schedule:

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Group Meetings, etc.

Hu Group Meeting	Mondays 10:30 - Noon		419
LIGO group meeting	Mondays 3:30 - 5:00		419
Grandi Group meeting	Tuesdays 9:00 – 10:30		419
Particle Cosmology Lunch	Tuesdays Noon - 1:30		419
HELIX Meeting	Tuesdays 1:30 - 3:00		419
KICP Cookies and Discussion	Tuesdays 3:00 - 4:00	ERC Coffee Bar	
Vieregg Group Meeting	Tuesdays: 4:00 – 5:00		445
SPT Group Meeting	Wednesdays 9:30 - Noon		345
Wakely Meeting	Wednesdays 1:00 - 3:30		419
SPT-DES Joint Analysis Meeting	Wednesdays 2:30 - 3:30		345
Privitera group meeting	Wednesdays 2:00 - 4:00		445
KICP/A&A Colloquium	Wednesdays 3:30 - 4:30		161
Life Long Learning Planning	Thursdays 10:00 - 11:00		419
Thunch	Thursdays Noon - 1:00		401
Hooper Group Meeting	Thursdays 2:30 - 4:30		419
Physics Colloquium	Thursdays 4:00 - 5:00	KPTC 106	
EO&D	Fridays (alternating) 9:30 - 11:00		445
KICP Friday Seminar	Fridays Noon - 1:00		401
Structure Formation Group Meeting	Fridays 3:00 - 5:00		419

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Meetings

- Workshops
  - The KICP likes to host one or more workshops each year.
  - We actively encourage Fellows to suggest and organize these workshops, don't be shy!
- At some point you'll be asked to participate in the quarterly Postdoc Symposium; a great chance to describe you work

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Jobs

- While not as all encompassing as we would like, please be aware of the job postings on our website. This could be the only place certain positions are advertised:
- KICP > For the Community > External Job Announcements
- http://kicp.uchicago.edu/community/job/

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Emergencies

- 911
- University
  - 123 (Works from Campus Phones)
  - 702.8181 (off-campus phone)
- Facilities: 773.834.1414 (24 hours)

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Anything Else?

- Questions, comments,….?

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Thanks for coming!