BoT – Finance Committee Update

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Gautschi Community Cluster – Phase 1

Support growing community cluster program for HPC

Problem

Steady demand for CPU-based community cluster supercomputing requires capacity refresh and increase every 15-18 months to enhance and/or replace older systems as they reach end of life.

Solution

Execute planned and budgeted lifecycle refresh of latest community cluster *"Gautschi"* in mid-2024.

Recommendation

Dell configuration with more powerful compute nodes and larger system than "Negishi" cluster.

Purdue Impact

- 234 (27%) of Purdue's 2023 earned doctorates used community clusters during their PhD program.
- **167 classes** encompassing ~3,000 students use community clusters in their coursework.
- Community clusters support **266 PIs from 66 departments**, all WL colleges and all 3 campuses.

Financial Impact

- Purdue's investment in this key core facility enables $364M of research expenditures in FY23, a **48x return** on the financial investment

	FY24	FY25	Total
Budgeted Investment	$2.6M	$3.5M	$6.1M

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Gautschi Community Cluster - Phase 2

Build Leadership Class Resource to Support AI

Problem

Computational research increasingly requires new resources, tools, and expertise to incorporate AI methods.

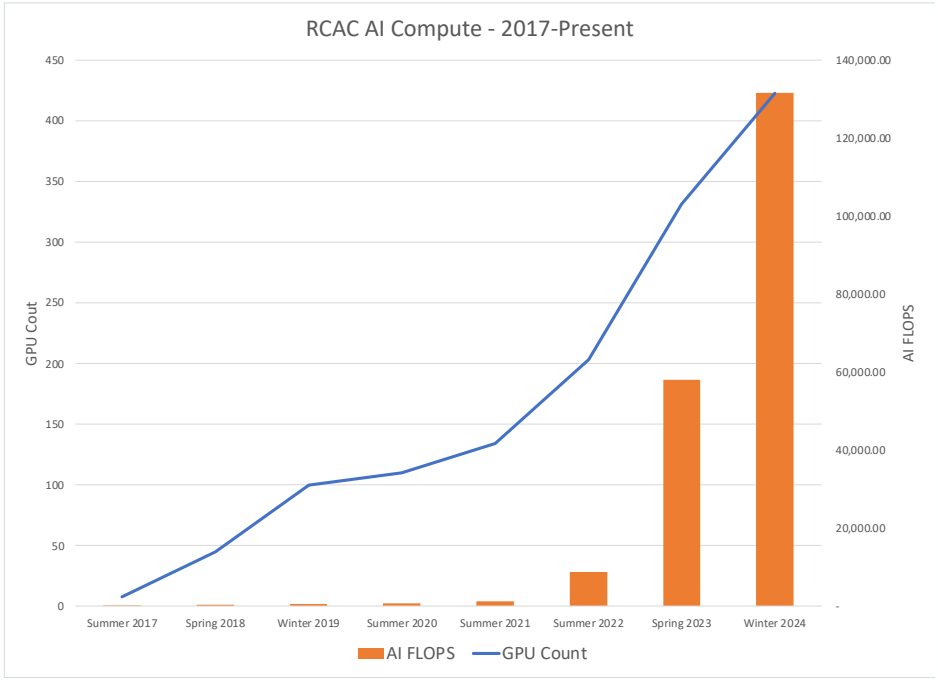
Solution

Build upon community cluster program to support AI computing.

- **Invest** into a leadership-scale (top 100) core AI resource
  - Support key AI faculty and initiatives like IPAI
  - Possible supplemental NSF funding for Anvil may offset Purdue direct investment
- **Build inventory** for low/mid-end AI capabilities
  - Build support for top AI faculty centrally, vs DIY AI solutions
- **Invest in human capital** as an enabler, partnering with IPAI, NSF Anvil project, National AI Research Resource (NAIRR)

Results to Date

- Purdue IT has provided 1.8x increase in AI capacity since FY23
  - *184 GPUs in 2023*
- Total AI faculty and labs investing in the program has grown from 11 PIs in 2017 to 72 in 2023



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Appendix

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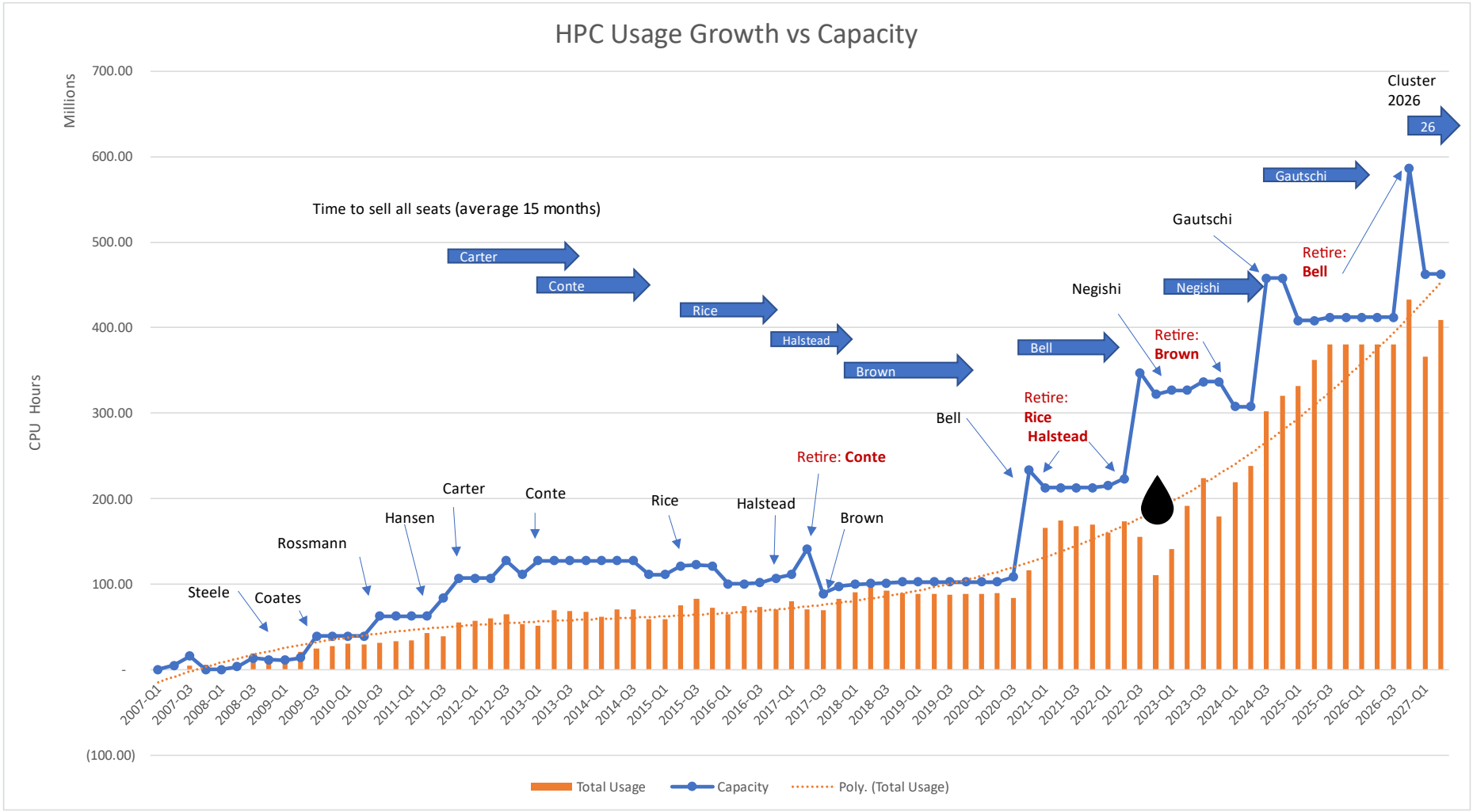
Capacity Planning:

We understand our sales and usage patterns to plan our lifecycle needs



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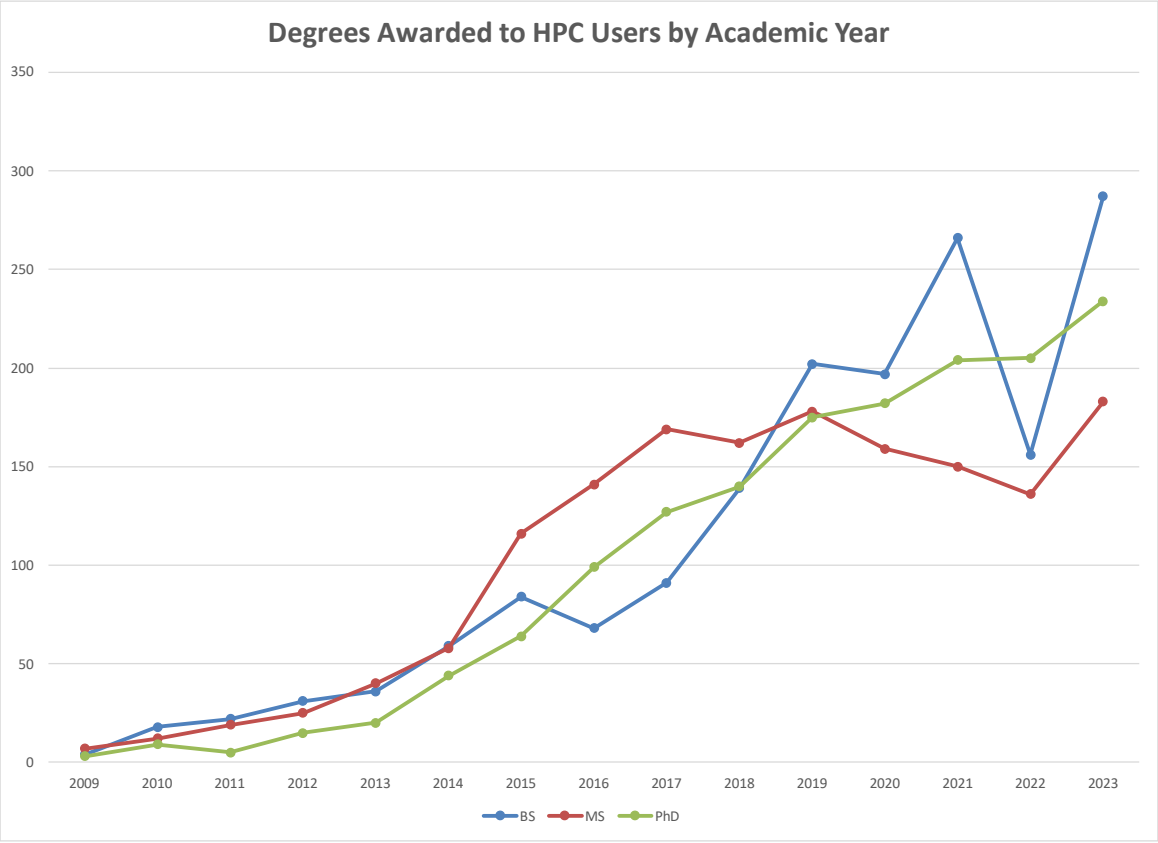
Impact on Students

To train students, HPC resources are critical tools to have available



Year	Earned Doctorates	HPC-Using Doctorates	% Using HPC
2010	639	9	1%
2011	672	5	1%
2012	656	15	2%
2013	687	20	3%
2014	735	44	6%
2015	709	64	9%
2016	727	99	14%
2017	740	127	17%
2018	758	140	18%
2019	738	175	24%
2020	808	182	23%
2021	802	204	25%
2022	835	205	25%
2023	851	234	27%

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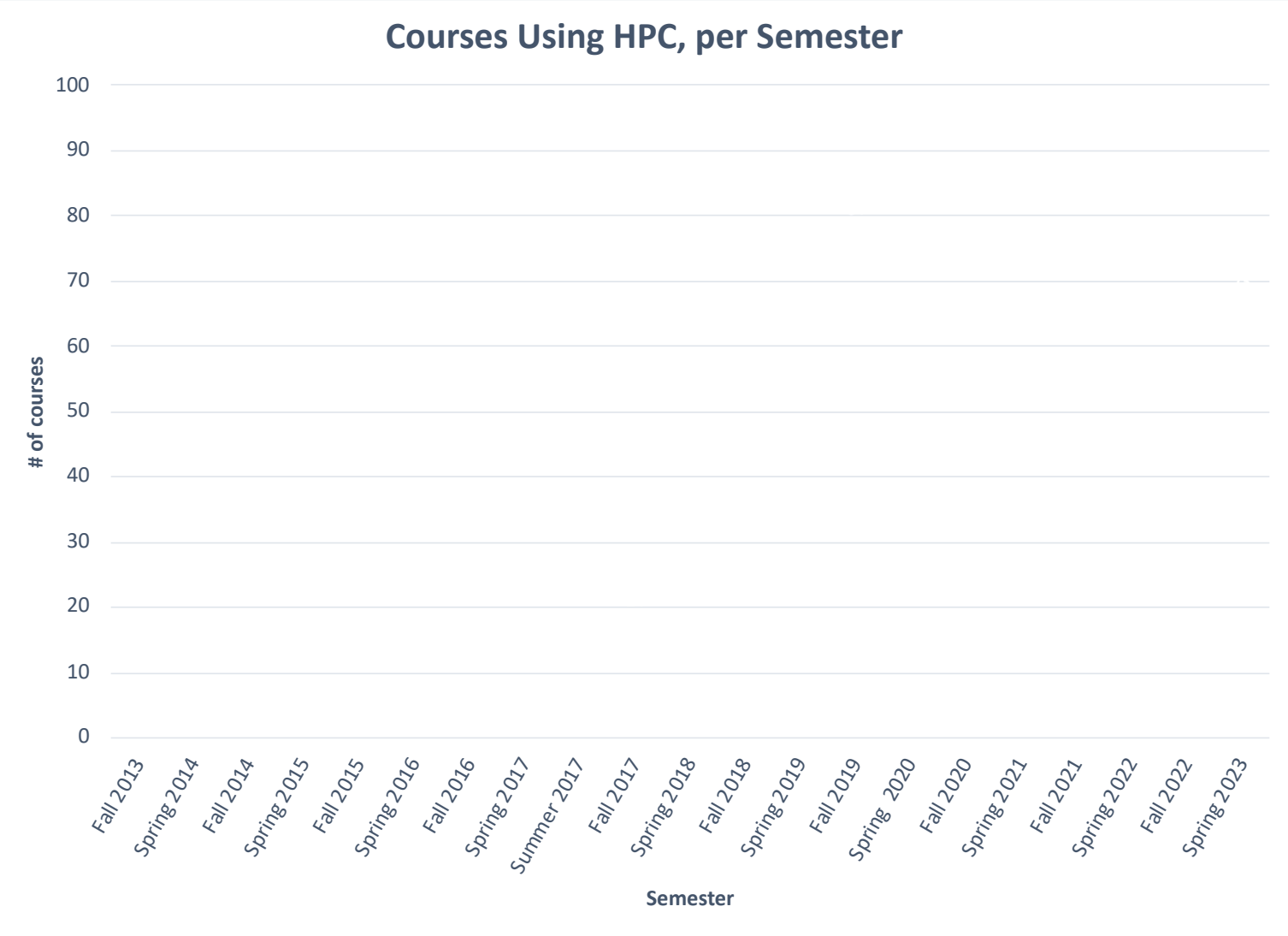
Impact on Courses

To train students, HPC resources are critical tools to have available

- During the 2022-23 AY, 167 courses used HPC for instructional purposes, impacting a total of over 3000 students.



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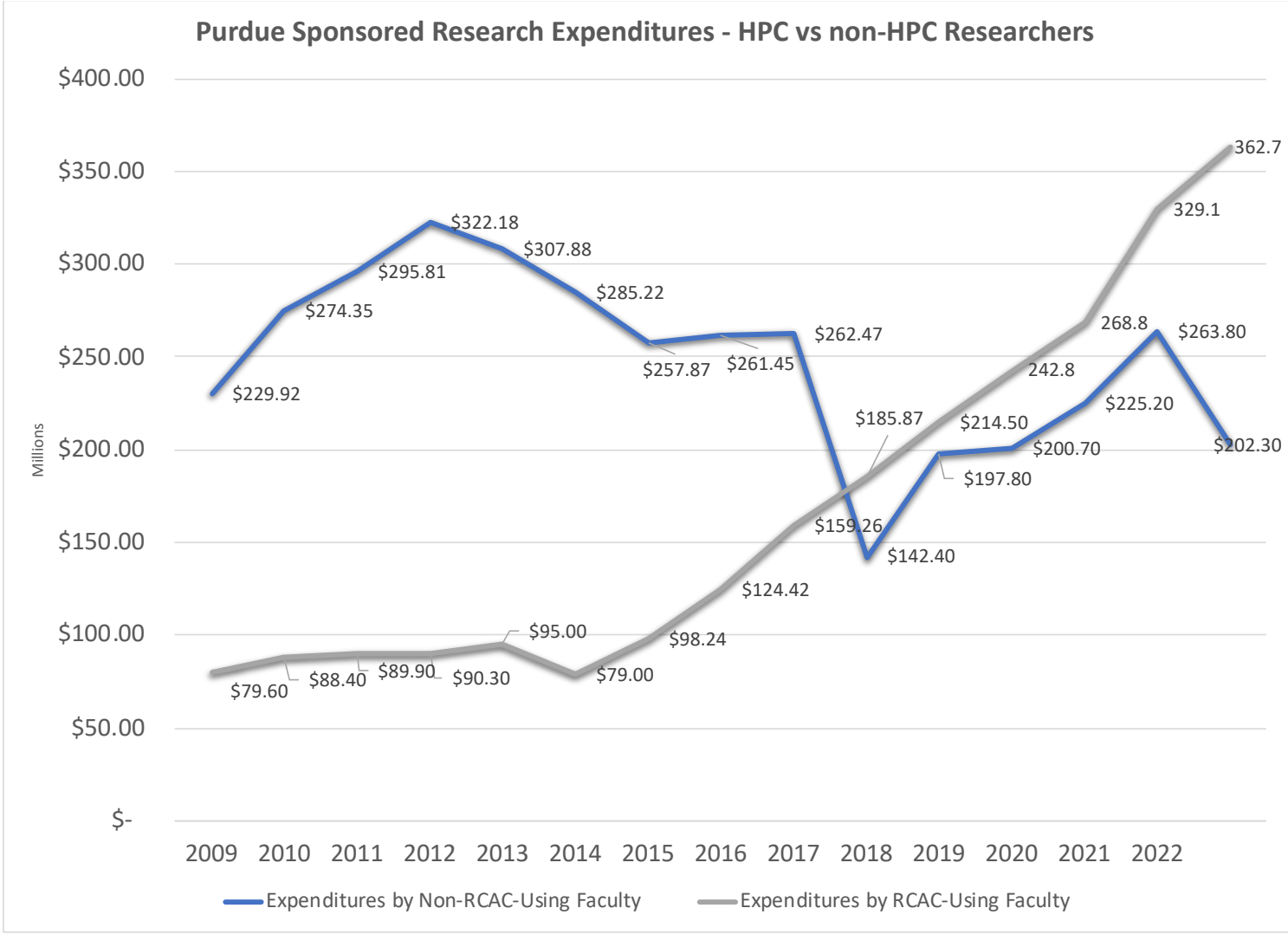
Financial Impact of HPC Investment

An increasingly large proportion of the research dollars go to users of HPC



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