



K-State 2025 Strategic Action and Alignment Plan

College or Major Unit: Arts & Sciences

Department: Physics

1. What are your Department's mission and vision and how does your organization contribute to achieving the University's and your College's/Major Unit's vision for K-State 2025?

- The Department of Physics at Kansas State University has a broad commitment to generate and disseminate knowledge. These roles are interrelated and complement each other. The mission of the department is four-fold:
- The Department has a mission to do fundamental research which contributes to its educational and to its research responsibilities in a research university.
- The Department has a responsibility to provide a sound education in physics to a wide range of students. One of the hallmarks of good instructors is that they are enthusiastic about their subject. No one is as enthusiastic about a subject as one who is making discoveries and contributing to the understanding of the subject.
- The Department has a commitment to enhance diversity among its faculty, staff, students, and graduates.
- Finally, the faculty members of the Department have a responsibility to provide service to the physics profession, to the university community, and to the citizens of Kansas.

2. What are your Department's key strategic activities and outcomes?

3. Identify [in brackets] which of your Department's strategic outcomes are directly linked to your College's/Major Unit's outcomes. (*If your Department or similar unit is not in a College or Major Unit, skip this question.*)

Key Activities	Short Term (2013 - 2015) Key Outcomes	Intermediate (2016 - 2020) Key Outcomes	Long Term (2021 - 2025) Key Outcomes
<p><i>What we plan to do...</i></p> <p>1. Advance the department to a much higher level of distinction. Of high priority is to add a National Academy member to our faculty. [College Themes: I, II, VI, VII, X]</p>	<p><i>What we expect to happen...</i></p> <p>Foundation and upper administration would lay groundwork for funding such a high profile hire. A target list of endowers will be developed. Endowed lectureships will be used to promote national/ international prominence of our faculty research. [College Themes: VII:C]</p>	<p><i>What we expect to happen...</i></p> <p>The department will fill at least one new endowed chair. Higher rankings of our CM, Cosmology, High Energy and PER groups will be attained; AMO ranking will be elevated to the Top 10 (from 13). Our faculty will be nominated for national awards and placed on influential professional committees and academies. [College Themes: VII:D]</p>	<p><i>What we expect to happen...</i></p> <p>The department will attain a National Academy-member physicist and continue to advance higher defeating geographical disadvantage. [College Themes: VII:D]</p>
<p>2. Alleviate the current, acute space-constraints in Cardwell Hall. Adequate, contiguous space for laboratory-based research; for specialized instrumentation; for interactive classroom-based teaching; and for interactive studio-based teaching is needed. The optimal solution is to move the Physics Department to a new building that is custom-designed to accommodate these needs. [College Themes: IV]</p>	<p>High capacity endowers will be identified. Connections will be made to state legislators and with House and Senate representatives in Manhattan to initiate state and federal funding. Current space will be optimized to enable strategic hires. Recent architectural plans for new addition will be updated. [College Themes: IV:B]</p>	<p>An integrated plan for a new customized teaching and research addition will be developed. Funding will be attained to gut and renovate 101, 102 and 103. Space will be designed to accommodate both the physical and temporal needs of the courses. [College Themes: IV:C,D]</p>	<p>The department will attain the contiguous, customized research and teaching buildings. [College Themes: IV:E]</p>

<p>3. Increase the number of faculty in the department to a level that is consistent with our strong and growing research stature and the growth of our service classes, particularly Engineering Physics and General Physics.</p> <p>The Department has a commitment to enhance diversity among its faculty.</p> <p>[College Themes: I, VIII, IX, X]</p>	<p>One new faculty line will be obtained, and additional resources/personnel will be obtained for expanding introductory physics classes.</p> <p>[College Themes: I:B]</p>	<p>At least two additional faculty lines will be obtained since 2013.</p> <p>[College Themes: I:C]</p>	<p>At least three new faculty lines will be added since 2013.</p> <p>[College Themes: I:C,E]</p>
<p>4. Have all research groups consist of more than one faculty members. The Department has a commitment to enhance faculty diversity.</p> <p>[College Themes: I, IX, X]</p>	<p>Foundation and upper administration would lay groundwork for funding such a high profile hire. A target list of endowers will be developed. Endowed lectureships will be used to promote national/ international prominence of our faculty research.</p> <p>[College Themes: I:B]</p>		
<p>5. Continue to recruit top faculty by exploiting various strategic opportunities. It is critical that we retain top faculty, as well. Of key importance is to make faculty salary commensurate with our aspirational physics departments. The Department has a commitment to enhance faculty diversity.</p> <p>[College Themes: I, II, III, VII, IX, X]</p>	<p>Ongoing dialogue with administration will be established that engenders rapid responsiveness when need-to-act hiring/retention issues arise. Donor support will be attained for outstanding hiring possibilities and endowing a chair. Chaired positions will be used for retention as well</p> <p>[College Themes: II:D; III:A; VII:C]</p>	<p>Established researchers will be identified and targeted. New chairs will be established.</p> <p>[College Themes: VII:D]</p>	<p>The field of benefactors will grow several times. Strategic administrative relationships and just-in-time hiring practices will be in place.</p> <p>[College Themes: III:C]</p>
<p>6. Underlying our research goals is the need to recruit and retain top graduate students. Of key importance is to make graduate-student stipend commensurate with our aspirational physics departments. The Department has a commitment to enhance graduate student diversity.</p> <p>[College Themes: VI, IX]</p>	<p>Expansion of Donoghue program to accommodate more US students and establishment of analogue for International students will be achieved in cooperation with the Graduate school. Undergraduate research opportunities, such as the REU which works as a feeder to grad recruitment, will be continued. Relief of faculty teaching in spring semester will be provided to better accommodate summer researchers. Some recognition (e.g. assignment of SRO funds) of faculty who mentor REU students will be in place.</p> <p>[College Themes: VI:B]</p>	<p>Stipends will rank in the upper tier of Big 12. Several ~\$50k endowments for stipend-augmentation will be in place.</p> <p>[College Themes: VI:F]</p>	<p>Top-of-Big 12 stipends will be achieved. Multiple stipend augmentations will be awarded each year.</p> <p>[College Themes: VI:G]</p>

<p>7. Focus on recruiting and retaining top undergraduate physics majors, and involve them in research during their tenure. Graduate these majors on appropriate time-scales. The Department has a commitment to enhance undergraduate student diversity. [College Themes: V, VIII, IX]</p>	<p>Reasonable and streamlined course plan for double majors will be established. Strict adherence to this plan will follow. Diverse career counseling—beyond academia—will be provided. More students will be involved in undergraduate research. Coordination of the honors program will be carried out following other Universities' footsteps. More faculty-undergrad social functions will occur. [College Themes: VIII:B]</p>	<p>The department will graduate the most physics majors per year amongst Kansas Colleges and Universities. [College Themes: V:E; VIII:D]</p>	<p>K-State Physics will be in top tier of Big-12 in terms of numbers of graduating majors. A thriving honors program will be in place.</p>
<p>8. Continue to bring in funding from the central administration to support research infrastructure in the department. [College Themes: IV]</p>	<p>Informative dialogue with dean/provost/VPR will be fostered to attain funds (in part) for renovation, technical support, service contracts, and wear-and-tear costs of major equipment, as well as start-up costs. [College Themes: IV:A,B]</p>	<p>Department level user facilities centered on new, MRI-funded instrumentation: SAXS; high power, ultrafast laser will be in place. [College Themes: IV:C]</p>	<p>University-level user-facilities: e.g. high performance materials manufacturing and characterization center will be in place. [College Themes: IV:E]</p>
<p>9. Generate new opportunities for contact, discourse, technology-transfer, and partnership between industry and our faculty, post-docs, and graduate students. Of key importance will be to continue to develop intellectual property that originates in faculty research outcomes and to develop a culture for commercializing this intellectual property. [College Themes: X]</p>	<p>KSURF will be informed of our promising accomplishments and superior capabilities that are of commercial interests. Nodes of excellence will be built. Companies will be visited. Direct technical dialogue with companies will take place. I-CORPS grants will be won. [College Themes: X:A]</p>	<p>Funding to bridge the technology transfer gap will be attained; industry-academic postdocs will be attained from companies and the University. [College Themes: X:E]</p>	<p>Physical space for nascent start-up companies will be attained.</p>
<p>10. Assess the current state of online education in Physics and understand the scope within which we might best execute this mode of teaching and learning. [College Themes: VIII]</p>	<p>Pilot proposal for contemporary physics based on software created by PER will be created. Other proposals such as Cosmology and Great Ideas in Physics will be considered. [College Themes: VIII:B]</p>	<p>Opportunities for faculty to produce unique online and blended course experiences may be explored. A position on the issue of hands-on demos in online physics courses will be developed. [College Themes: VIII:C]</p>	

4a. What resources and/or opportunities exist for your Department to achieve its vision and outcomes?

Physics is a premier department at Kansas State University. With only 27 permanent faculty members, we receive competitive external funding of about \$7.0 million each year which places us nationally in the top 50-55 ranking. We do extremely well in terms of federally funded research per faculty when compared to our peers. Our Atomic-Molecular-Optical (AMO) physics program consistently ranks in the top 15 in the nation. Many of our faculty have received national and local awards: Physics faculty includes two Carnegie National Professor of the year winners, nine Fellows of American Physical Society (APS) and one of American Association for Advancement of Science (AAAS), four winners of outstanding junior investigator awards (given by NSF and DOE), five University Distinguished Professors and four winners of K-State's Presidential Award for Outstanding Undergraduate Teaching. K-State Physics has won more High Energy Physics Outstanding Junior

Investigator (OJI) awards from the Department of Energy (DOE) than any other US institution during the period from 1994 when the High Energy Physics program began at K-State to 2008, when the DOE program changed from OJI to Early Career.

4b. What resources and/or opportunities are needed for your Department to achieve its vision and outcomes?

Support from Foundation and upper administration is needed to attract major donors. This will lay groundwork to raise funds for research facilities, faculty hire and retention, chaired faculty positions, and graduate student recruitment. Funding from State and Federal sources, the attainment of which will also require the upper administration's support, is another resource that is essential to our proposed research, teaching, and diversity goals.

5. How do you propose to acquire the resources needed for your Department to accomplish its vision and outcomes?

Foundation and upper administration would help the department to develop a target list of donors and visit with high capacity donors.

Connections will be made with state legislators and with House and Senate representatives in Manhattan in order to initiate state and federal funding.

An ongoing dialogue with administration will be established that engenders rapid responsiveness when need-to-act hiring and retention issues arise.

6. How does your plan link to the K-State 2025 University Benchmark Metrics, Common Elements, and Thematic Goals, Outcomes, and Metrics? (See below)

6. Departmental Links to K-State 2025 University Benchmark Metrics, Common Elements, and Thematic Goals, Outcomes, and Metrics

Links to Benchmark Metrics	Links to Common Elements
<p>B-1 - Total research and development expenditures B-2 - Endowment pool B-3 - Number of national academy members B-4 - Number of faculty awards B-5 - Number of doctorates granted annually B-6 - Freshman-to-sophomore retention rate B-7 - Six-year graduation rate B-8 - Percent of undergraduate students involved in research</p>	<p>CE-1 - Communications and Marketing CE-3 - Diversity CE-4 - External Constituents CE-5 - Funding CE-6 - International CE-8 - Technology</p>

Links to University Thematic Goals, Outcomes, and Metrics			
Links to 2025 Thematic Goals and Metrics	Links to Short Term Outcomes (2011 – 2015)	Links to Intermediate Outcomes (2016 – 2020)	Links to Long Term Outcomes (2021 – 2025)
<p>T1 - Research, Scholarly and Creative Activities, and Discovery (RSCAD)</p> <p>Theme 1 Metrics:</p> <p>T1-1 - # of interdisciplinary research projects, institutes, and centers T1-2 - Total sponsored extramural funding expenditures T1-4 - # of refereed scholarly publications per academic year and allocated faculty member T1-5 - Total international research and development expenditures</p>	<p>T1-A - Increased intellectual and financial capital to support RSCAD</p> <p>T1-B - More clusters/centers of collaborative RSCAD focus</p> <p>T1-C - Increased funding for investigator-based research, research centers, and graduate training grants</p> <p>T1-D - Tuition waivers for all GRAs</p> <p>T1-E - Competitive compensation and support available to GRAs, GTAs, and GAs</p> <p>T1-F - Enhanced and systematic approach for UG research</p> <p>T1-G - Successful recruitment, retention, evaluation, compensation, and rewards strategies in place to support RSCAD needs</p> <p>T1-H - Enhanced visibility and appreciation for research, discovery, and scholarly and creative activities</p>	<p>T1-I - Intellectual and financial capital in place for expanded RSCAD efforts</p> <p>T1-J - Greater proportion of nationally and internationally recognized award-winning faculty in RSCAD programs</p> <p>T1-K - Nationally and internationally recognized research centers</p> <p>T1-L - Recognized for prominent and productive placement of our graduates</p> <p>T1-M - Increased participation by undergraduates in expanded opportunities in research</p>	<p>T1-N - Fifty nationally recognized K-State researchers, a high proportion of which are members of their national academies</p> <p>T1-O - Extramural funding competitive with our benchmark institutions</p> <p>T1-P - Research and development expenditures competitive with benchmark institutions</p> <p>T1-Q - Competitive amongst our peers in the percentage of undergraduates involved in research</p>

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<p>T2 - Undergraduate Educational Experience (UEE)</p> <p>Theme 2 Metrics:</p> <p>T2-3 - Total funding awarded for undergraduate scholarship support</p> <p>T2-4 - # and % of students participating in an undergraduate student success program</p> <p>T2-5 - # of students awarded national and international prestigious scholarships</p> <p>T2-6 - % of undergraduate enrollment by demographic group</p> <p>T2-7 - Student satisfaction and utilization rates</p>	<p>T2-A - Excellent, customized academic advising and services available to all students to support their success and degree completion</p> <p>T2-B - Engaged students benefitting from high impact educational practices used by excellent faculty and staff across the university</p> <p>T2-C - Increased participation by undergraduates in expanded opportunities for meaningful research</p> <p>T2-D - Successful integration of undergraduate education and meaningful research is standard practice</p> <p>T2-E - Effective evaluation practices that recognize and reward teaching, advising, and life-long learning/professional development</p> <p>T2-F - Effective system in place that supports and promotes teaching excellence</p> <p>T2-G - Successful recruitment and retention strategies that address our entire student population</p> <p>T2-H - Improved six-year graduation rates and retention ratios</p>	<p>T2-I - Integrated learning communities experienced by students, faculty, and staff that promote student success within a culture of excellence</p> <p>T2-J - Excellent reputation for high quality teaching and advising that prepares students for their professional, community, social, and personal lives</p> <p>T2-K - Superior and diverse faculty recognized for teaching excellence</p> <p>T2-L - All UG students engaged in a diversity of experiences that expand their viewpoint</p> <p>T2-M - Increased undergraduate contributions in the creation of scholarship through research</p> <p>T2-N - Ongoing improvement of six-year graduation rates and retention ratios</p>	<p>T2-O - An undergraduate educational experience recognized as one of the best among the nation's Top 50 Public Research Universities</p> <p>T2-P - Faculty teaching and advising awards comparable to our benchmark institutions</p> <p>T2-Q - Freshman to Sophomore retention ratios comparable to benchmark institutions</p> <p>T2-R - Six-Year graduation rates comparable to benchmark institutions</p>

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T3 - Graduate Scholarly Experience Theme 3 Metrics: T3-1 - # and % of graduate students with assistantships, endowed scholarships, and fellowships T3-2 - Total funds awarded for graduate assistantships, endowed scholarships, and fellowships T3-5 - # of graduate students participating in a unique high level learning and experiential training T3-6 - # of graduate terminal degrees awarded T3-8 - Graduate student satisfaction and utilization rates	T3-A - Competitive compensation and support available for GRAs, GTAs, and GAs T3-B - Tuition waivers for all GRAs T3-D - Outstanding mentoring for our graduate students T3-E - Expectation of excellence for the graduate scholarly experience T3-F - Increased capacity to secure funding for graduate research and teaching T3-H - Expanded partnerships with industry and government to provide high level learning and experiential training opportunities for graduate students	T3-I - Increased participation by our graduate students in unique high level learning and experiential training T3-J - Expanded reputation for outstanding graduates with the critical skill sets needed to excel in their careers in a global environment T3-K - Increased funding for graduate research and teaching T3-L - Increased number of nationally and internationally recognized award-winning graduate faculty T3-M - Increased number of Doctorates Awarded	T3-N - National and international reputation for outstanding graduates with demonstrable career success T3-O - World-class reputation as a preferred destination for outstanding graduate students T3-P - Stable funding for graduate research and teaching competitive with benchmark institutions T3-Q - Doctorates Awarded comparable with benchmark institutions
T4 - Engagement, Extension, Outreach and Service Theme 4 Metrics: T4-6 - Economic impacts on rural and urban communities in Kansas	T4-D - Increased numbers and diversity of faculty and staff participating in Engagement T4-G - Enhanced visibility and appreciation for Engagement and its interconnectedness with research and education within our university community		T4-P - Recognized as a leader in Engagement reaching both rural and urban communities

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T5 - Faculty and Staff Theme 5 Metrics: T5-1 - # of national and international faculty awards T5-2 - # and % of faculty with endowed chairs, professorships, and fellowships T5-3 - Competitive compensation packages for faculty and staff T5-4 - # and % of faculty and staff participating in international experiences T5-5 - % of tenure/tenure-track faculty by demographic group T5-7 - % of faculty and staff reporting satisfaction in the work environment	T5-A - Total compensation competitive with aspirant university and regional employers for faculty and staff in high priority areas T5-D - Effective evaluation processes that result in accountable faculty and staff with a clear understanding of their job expectations and how they contribute to the University's mission	T5-E - Total compensation competitive with aspirant university and regional employers for all employees T5-F - Faculty and staff current with developments in their fields and the skills needed to achieve excellence in performing their jobs T5-G - Successful recruitment and retention of a talented and high performing, diverse workforce	T5-H - Talented and high performing, diverse workforce recognized for excellence and award-winning faculty and researchers T5-I - Stable funding available for recruitment and retention of top level faculty and staff T5-J - Optimal number of faculty and staff comparable with our benchmark institutions
T6 - Facilities and Infrastructure Theme 6 Metrics: T6-2 - Total expenditures for physical facilities and infrastructure projects	T6-A - Responsive, timely, and strategic facilities services aligned with campus operational needs as well as future planning and implementation	T6-D - Adequate office space for all K-State employees equipped to support their work and productivity	T6-G - High quality, technology enabled, flexible and adaptable classroom space appropriate to the evolving needs of the learning environment and readily available to K-State faculty and students T6-H - High-quality research laboratories and specialty spaces that enhance research and scholarly activities T6-I - Well-maintained buildings, utilities, IT infrastructure, and grounds consistent with the expectations and image of a highly ranked land grant research and teaching institution T6-J - An excellent campus community experience supported by facilities and landscapes that enhance social interaction, learning

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			<p>and collaboration</p> <p>T6-K - Signature facilities that promote collaborative learning and working environments, multidisciplinary work, and integrated interaction between students, faculty, researchers, staff, and administrators</p>