

CHANGE UNDERGRADUATE DEGREE PROGRAM

PLEASE NOTE: To ensure that a series of changes to an existing degree program does not essentially create a new program, the Southern Association for the Accreditation of Colleges and Schools (SACS) requires submission of its Substantive Change Checklist for every program change. Prior to college-level review, you must fill out and submit the [SACS Substantive Change Checklist](#) to the Office of Institutional Effectiveness. Contact Institutional Effectiveness (OSPIE@uky.edu) for assistance.

Once approved at the college level, your college will send the proposal to the appropriate Senate academic council (HCCC and/or UC) for review and approval. Once approved at the academic council level, the academic council will send your proposal to the Senate Council office for additional review and then a 10-day posting online, during which senators review on their own and have an option to register an objection if they so desire. If no objection is raised to the Senate Council Office within ten days of the posting the proposal, then the program change is approved. The Senate Council Office will report approvals to the Provost, Registrar and other appropriate entities, including the contact person.

For every proposed change, you MUST also include the existing requirement.

SUMMARY OF CHANGES

Check all that apply.

- | | | | |
|--|---|--|--|
| <input checked="" type="checkbox"/> Courses | <input type="checkbox"/> Program name | <input type="checkbox"/> Total required credit hours | <input type="checkbox"/> Student learning outcomes |
| <input type="checkbox"/> Criteria for admissions/progression/termination | <input type="checkbox"/> Certificate assessment | <input type="checkbox"/> Other | |

1. General Information

1a	Date of contact with Institutional Effectiveness (IE) ¹ :	2-18-2019		
	<input checked="" type="checkbox"/> Appended to the end of this form is a PDF of the reply from Institutional Effectiveness.			
1b	College ² :	Arts and Sciences	Department ² :	Physics and Astronomy
1c	CIP code ³ :	40.0801	Today's Date:	2/21/19
1d	Current major name: (Biology, Design, etc.)	Physics	Proposed major name:	Physics
1e	Current Degree (BA, BFA, etc.):	BS	Proposed degree:	BS
1f	Will there be any changes regarding a track(s) for the program?			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1g	Accrediting agency, if applicable:			
1h	Date of most recent periodic program review for this degree:	January 2019		
1i	Requested effective date:	<input checked="" type="checkbox"/> Fall semester following approval.	OR	<input checked="" type="checkbox"/> Specific Date ⁴ : Fall 2019

¹ Prior to college-level review, you must fill out and submit the SACS Substantive Change Checklist to the Office of Institutional Effectiveness. You can reach Institutional Effectiveness by phone or email (257-1962 or OSPIE@uky.edu).

² It is not possible to change the home academic unit of a degree program via this form. To change the home unit, visit <https://www.uky.edu/universitysenate/forms> and look for the heading, "Forms Related to Academic Organizational Structure."

³ The CIP code is provided by Institutional Effectiveness. If a different CIP code is necessary, the program may undergo a review similar to the new program approval process.

⁴ No program change(s) will be effective until all approvals are received.

1j	Contact person name:	Renee Fatemi	Phone / Email:	257 / 2664
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2. Overview of Changes

2a	Describe the rationale for the changes, including results from the most recent program review if applicable. (450 word limit)
	The subject of Thermodynamics and Statistical Physics, along with Classical Mechanics, Quantum Mechanics and Electromagnetism, serves as one of the four pillars of a canonical Bachelor of Science Degree in Physics. Although this course is required for majors receiving a B.S. in Physics at all of our benchmark universities, it is not currently required at the University of Kentucky. While our students are strongly encouraged to enroll in the fall of their senior year, especially if they plan to apply to and attend graduate school, the course is regularly canceled due to low enrollment. As a result our students are handicapped when taking the subject GRE and when applying to graduate programs in physics and astronomy. The techniques taught in a standard Statistical Physics course are invaluable and applicable to all the subfields of research in physics and astronomy. The department unanimously agrees that an undergraduate Statistical Physics course should be required to earn a B.S. degree in Physics.

2b	Use the fields below, as applicable, to identify the areas in which changes will be made.		
		Current	<i>Proposed</i>
i.	Credit Hours of Premajor Courses:	28	28
ii.	Credit Hours of Preprofessional Courses:	0	0
iii.	Credit Hours of Major Core Course Requirements	39	42
iv.	Minimum Credit Hours of Guided Electives:	6	6
v.	Minimum Credit Hours of Free Electives:		
vi.	Credit Hours for Track 1 (name):		
vii.	Credit Hours for Track 2 (name):		
viii.	Credit Hours for Track 3 (name):		
ix.	Credit Hours for Track 4 (name):		
x.	Credit Hours for Track 5 (name):		
xi.	Credit Hours for Required Minor:		
xii.	Total Credit Hours Required by Level:		
	100-level:	15	15
	200-level:	26	26
	300-level:	8	8
	400-level:	15	15
	500-level:	9	12

	TOTAL CREDIT HOURS REQUIRED FOR GRADUATION:	<u>120</u>	<u>120</u>
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xv.	If the total hours required for graduation have changed, explain below. (150 word limit)
	The total credit hours for the B.S. degree in physics will change by 3 credits from 45 to 48 credits. This is very much in line with other natural sciences majors such as Biology (56), Chemistry (56) and Neutrosience (50-55)

2c	Will the requested change(s) result in the use of courses from another educational unit?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	If "Yes," describe generally the courses and how they will used.		

If "Yes," two pieces of supporting documentation are required.

Check to confirm that appended to the end of this form is a letter of support from the appropriate chair/director⁵ of each unit from which individual courses will be used.

Check to confirm that appended to the end of this form is verification that the chair/director of each affected unit has consent from the faculty members of the unit. This typically takes the form of meeting minutes.

2d	Will the proposed change(s) affect an associated minor?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If "Yes," the department must also submit a change form to change the minor.			

3. UK Core Courses

3a	Are there any proposed changes to the UK Core requirements for the program? (If "Yes," indicate and proceed to next question. If "No," indicate and proceed to 4a.)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If "Yes," note the specific changes in the grid below.			

UK Core Area	Current Course	Current Credits	Proposed Course	Proposed Credits
I. Intellectual Inquiry				
Arts and Creativity				
Humanities				
Social Sciences				
Natural/Physical/Mathematical				
II. Composition and Communication				
Composition and Communication I	CIS/WRD 110	3	<i>CIS/WRD 110</i>	3
Composition and Communication II	CIS/WRD 111	3	<i>CIS/WRD 111</i>	3
III. Quantitative Reasoning				
Quantitative Foundations				
Statistical Inferential Reasoning				
IV. Citizenship (one course in each area)				
Community, Culture & Citizenship in USA				
Global Dynamics				
Total UK Core Hours		=====		=====

3b	Provide the Bulletin language about UK Core.
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4. Graduation Composition and Communication Requirement

4a	Will the Graduation Composition and Communication requirement be changed? (If "Yes," indicate and proceed to next question. If "No," indicate and proceed to 5a.)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If "Yes," note the specific changes below, including changes to credit hours.			

⁵ A dean may submit a letter only when there is no educational unit below the college level, i.e. there is no department/school.

CHANGE UNDERGRADUATE DEGREE PROGRAM

If the course(s) used are from outside the home unit, one piece of supporting documentation is required.

Check to confirm that appended to the end of this form is a letter of support from the other units' chair/director⁶ from which individual courses will be used.

	Current	<i>Proposed</i>
i.	<input type="checkbox"/> Single course in home unit:	<input type="checkbox"/> <i>Single course in home unit:</i>
ii.	<input type="checkbox"/> Multiple courses in home unit.	<input type="checkbox"/> <i>Multiple courses in home unit.</i>
iii.	<input type="checkbox"/> Single course outside home unit.	<input type="checkbox"/> <i>Single course outside home unit.</i>
iv.	<input type="checkbox"/> Multiple courses outside home unit.	<input type="checkbox"/> <i>Multiple courses outside home unit.</i>
v.	<input type="checkbox"/> Course(s) inside & outside home unit.	<input type="checkbox"/> <i>Course(s) inside & outside home unit.</i>

4b Provide the Bulletin language about GCCR below.

5. Other Course Changes

5a Will the college-level requirements change? (If "Yes," indicate and note the specific changes in the grid below. If "No," indicate and proceed to question 5c.) Yes No

Current			<i>Proposed</i>			
<input type="checkbox"/> Standard college requirement			<input type="checkbox"/> <i>Standard college requirement</i>			
<input type="checkbox"/> Specific course			<input type="checkbox"/> <i>Specific course</i>			
Prefix & Nmbr	Credit Hrs	Title	<i>Prefix & Nmbr</i>	<i>Credit Hrs</i>	<i>Title</i>	<i>Course Status⁷</i>
						Select one....
						Select one....
						Select one....

5b Will the existing language in the Bulletin about college-level requirements change? Yes No
If "Yes," provide the new language below.

5c Will the pre-major or pre-professional course requirements change? (If "Yes," indicate and note the specific changes in the grid below. If "No," indicate and proceed to question 5e.) Yes No

Current			<i>Proposed</i>			
						Select one....
						Select one....
						Select one....

⁶ A dean may submit a letter only when there is no educational unit below the college level, i.e. there are no departments/schools.

⁷ Use the drop-down list to indicate if the course is a new course ("new"), an existing course that will change ("change"), or if the course is an existing course that will not change ("no change").

⁸ Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not change.

CHANGE UNDERGRADUATE DEGREE PROGRAM

						Select one....
						Select one....
						Select one....
						Select one....

5h Provide the Bulletin language for guided electives.

5i Will the free electives change? (If "Yes," indicate and note the specific changes in the space below. If "No," indicate and proceed to question 5j.) Yes No

5j Does the proposed change affect any track(s)? (If "Yes," note the specific changes using the grid below. If "No," proceed to question 6.) Yes No
 If more than one track is affected, click [HERE](#) for a template. Append a PDF for each affected track to the end of this form.

Track Name:		<input type="checkbox"/> New Track	<input type="checkbox"/> Changed Track	<input type="checkbox"/> Deleted Track		
Current			Proposed			
Prefix & Nmbr	Credit Hrs	Title	Prefix & Nmbr	Credit Hrs	Title	Course Status ¹¹
						Select one....
						Select one....
						Select one....
						Select one....
						Select one....
						Select one....

5k Provide the Bulletin language for the track.

6. Semester by Semester Program

List below the typical semester-by-semester program for the major. If multiple tracks are available, click [HERE](#) for a template for additional tracks and append a PDF of each track's courses to the end of this form.

YEAR 1 – FALL: (e.g. "BIO 103; 3 credits")	no change	YEAR 1 – SPRING:	<i>no change</i>
YEAR 2 - FALL :	no change	YEAR 2 – SPRING:	<i>no change</i>
YEAR 3 - FALL:	no change	YEAR 3 - SPRING:	<i>no change</i>
YEAR 4 - FALL:	remove "(suggested)", otherwise no change	YEAR 4 - SPRING:	<i>no change</i>

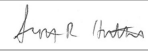

7. Approvals/Reviews

¹¹ Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not change.

CHANGE UNDERGRADUATE DEGREE PROGRAM

Information below does not supersede the requirement for individual letters of support from educational unit administrators and verification of faculty support (typically takes the form of meeting minutes).

In addition to the information below, attach documentation of department and college approval. This typically takes the form of meeting minutes but may also be an email from the unit head reporting department- and college-level votes.

		Reviewing Group Name	Date Approved	Contact Person Name/Phone/Email	
7a	(Within College)				
		A&S EPC	3/5/19	Scott Hutson /	/ 
		A&S Assoc. Dean	3/5/19	Anna Bosch /	/ 
				/	/
				/	/
7b	(Collaborating and/or Affected Units)				
				/	/
				/	/
				/	/
				/	/
				/	/
7c	(Senate Academic Council)		Date Approved	Contact Person Name	
	Health Care Colleges Council (if applicable)				
	Undergraduate Council		4/2/19	Joanie Ett-Mims	

The logo consists of a white rectangular area with rounded corners, centered within a larger blue rounded rectangular border. The text "OSPIE Approval" is centered within the white area.

OSPIE Approval

From: [Fatemi, Renee](#)
To: [Harmon, Camille](#)
Subject: Fwd: Substantive Change Decision
Date: Tuesday, February 19, 2019 3:04:14 PM

Hi Camille,

I believe this is the verification that OSPIE has reviewed the proposal. Let me know if you need something other than an email and I will contact them.

Thanks,
Renee

----- Forwarded message -----

From: <noreply@qualtrics-survey.com>
Date: Tue, Feb 19, 2019 at 11:31 AM
Subject: Substantive Change Decision
To: <renee.fatemi@uky.edu>

Dear Renee Fatemi,

Thank you for your email regarding the proposed program change(s) to **Physics, Bachelor's (40.0801)**.

My email will serve 2 purposes: 1.) Next steps for SACSCOC, and 2.) Verification and notification that you have contacted OSPIE—a Senate requirement for proposal approval.

1. **Next steps for SACSCOC:** None required
2. **Verification that OSPIE has reviewed the proposal:** Based on the proposal documentation presented and Substantive Change Checklist, the proposed program changes (refer to list below) are not substantive changes as defined by the University or SACSCOC, the university's regional accreditor. Therefore, no additional information is required by the Office of Strategic Planning & Institutional Effectiveness at this time. The proposed program change(s) may move forward in accordance with college and university-level approval processes.

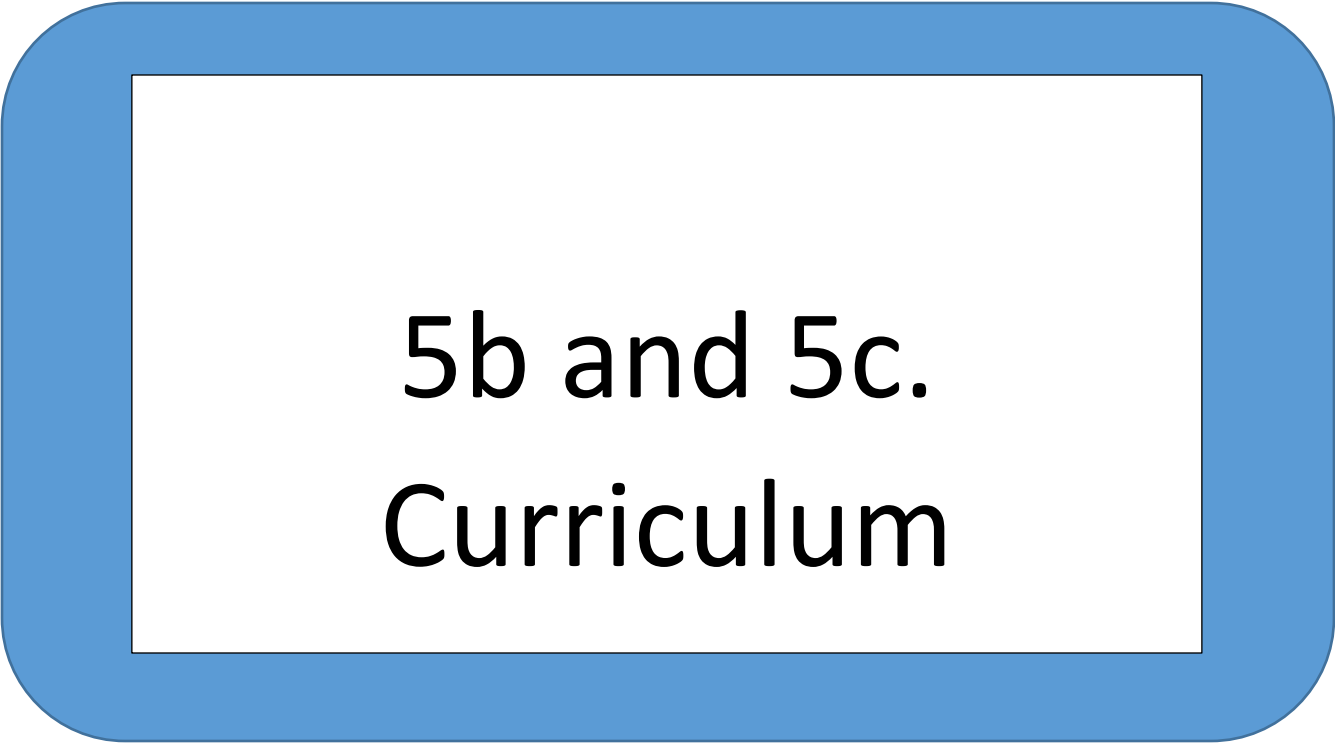
Description of Proposed Change(s):

· We are proposing to change PHY 522, Thermodynamics and Statistical Physics, from an elective to a requirement for the Physics B.S. This will add 3 credits to the total core credits required, raising it from 45 to 48 credits total.

Should you have questions or concerns about UK's substantive change policy and its procedures, please do not hesitate contacting our office.

Office of Strategic Planning & Institutional Effectiveness
University of Kentucky

Visit the Institutional Effectiveness Website: <http://www.uky.edu/ie>



5b and 5c.
Curriculum

Current

Major Requirements

Major Core Requirements

PHY 306 Theoretical Methods of Physics	3
PHY 335 Data Analysis for Physicists	2
PHY 361 Principles of Modern Physics	3
PHY 404G Mechanics	3
PHY 416G/417G Electricity and Magnetism	6
PHY 520 Introduction to Quantum Mechanics I	3
PHY 521 Introduction to Quantum Mechanics II	3
PHY 535 Advanced Physics Laboratory	3
MA 213 Calculus III	4
MA 214 Calculus IV	3
plus two different courses from the following:	
AST/PHY 395 Independent Work	
in Astronomy/Physics	3
PHY 402G Electronic Instrumentation	
and Measurements	3
PHY 435 Intermediate Physics Laboratory	3
PHY 508 Computational Physics	3
Major Core hours:	39

Proposed

Major Requirements

Major Core Requirements

PHY 306 Theoretical Methods of Physics	3
PHY 335 Data Analysis for Physicists	2
PHY 361 Principles of Modern Physics	3
PHY 404G Mechanics	3
PHY 416G/417G Electricity and Magnetism	6
PHY 520 Introduction to Quantum Mechanics I	3
PHY 521 Introduction to Quantum Mechanics II	3
PHY 522 Thermodynamics and Statistical Physics	3
PHY 535 Advanced Physics Laboratory	3
MA 213 Calculus III	4
MA 214 Calculus IV	3
plus two different courses from the following:	
AST/PHY 395 Independent Work	
in Astronomy/Physics	3
PHY 402G Electronic Instrumentation	
and Measurements	3
PHY 435 Intermediate Physics Laboratory	3
PHY 508 Computational Physics	3
Major Core hours:	42

6. 4-year plan

4-YEAR CURRICULAR MAP

Bachelor of Science in Physics

FALL	YEAR 1		SPRING
‡UK Core CC1	3	UK Core CC2	3
UK Core QFO (MA113: Calculus I)	4	MA 114: Calculus II	4
UK Core NPM (PHY 231: General Univ. Physics I)	4	PHY 228: Optics, Relativity and Thermal Physics	3
UK Core NPM (PHY 241: General Univ. Physics Lab I)	1	CHE 107: General Chemistry II	3
CHE 105: General Chemistry I	4		
	Total Credits: 16		Total Credits: 13
FALL	YEAR 2		SPRING
⌘Foreign language 101	4	⌘Foreign language 102	4
A&S NS (PHY 232: General Univ. Physics II)	4	UK Core SIR	3
A&S Lab (PHY 242: General Univ. Physics Lab II)	1	MA 214: Calculus IV	3
PHY 335: Data Analysis for Physicists	2	PHY 306: Theoretical Methods of Physics	3
MA 213: Calculus III	4	PHY 361: Principles of Modern Physics	3
	Total Credits: 15		Total Credits: 16
FALL	YEAR 3		SPRING
⌘Foreign language 201	3	⌘Foreign language 202	3
UK Core ACR	3	UK Core HUM	3
PHY 404G: Mechanics	3	UK Core SSC	3
PHY 416G: Electricity and Magnetism I	3	PHY 417G: Electricity and Magnetism	3
(200+ Related Elective outside PHY)	3	PHY 402G or 435 or 508 or AST/PHY 395	3
	Total Credits: 15		Total Credits: 15
FALL	YEAR 4		SPRING
UK Core GDY	3	UK Core CCC	3
A&S SS	3	A&S HUM (PHI 200+)	3
PHY 402G or 435 or 508 or AST/PHY 395	3	PHY 521: Introduction to Quantum Mechanics II	3
PHY 520: Introduction to Quantum Mechanics	3	PHY 535 (GCCR): Advanced Physics Laboratory	3
PHY 522: Thermodynamics & Statistical Physics	3	◇ (200+ Related Elective outside PHY)	3
	Total Credits: 15		Total Credits: 15

‡ Incoming Students are Strongly Encouraged to take WRD 112 to fulfill the CC1 and CC2 requirements if they have any of the following: an ACT English score of 32 or Higher, an SAT Verbal score of 720 or Higher, or an AP English Composition score of 4 or 5. If the Student has been accepted into the University Honors Program, the Student is required to take WRD 112 to fulfill CC1 and CC2.

⌘ Students who have taken at least 2 years of a language in high school can complete the A&S Foreign Language Requirement with 3 college semesters of a different language. Students choosing this option should replace the 4th semester of language with electives. Also note that if you take a foreign language placement exam, you may be exempt from 1 or more of the beginning semesters of that language. In this case, replace the by-passed language courses with electives. Any language sequence may be used to satisfy the foreign language requirements.

◇ 6 hours of 'free' electives - that do not count toward any other requirement - must be taken. Additional electives may be required to reach the required minimum of 120 hours. Consider pursuing a 2nd major or minor.

It is strongly encouraged that students take MA 322 and CS 115.

UK Core Abbreviations

HUM =Intellectual Inquiry in the Humanities

NPM=Intellectual Inquiry in the Natural/Physical/Mathematical Science

SSC=Intellectual Inquiry in Social Sciences

ACR=Intellectual Inquiry in Arts & Creativity

CC1= Composition and Communication I

CC2= Composition and Communication II

QFO= Quantitative Foundations

SIR= Statistical Inferential Reasoning

CCC= Community, Culture and Citizenship in U.S.

GDY= Global Dynamics

GCCR = Graduation Composition and Communication

College of Arts & Sciences Abbreviations

SS: Social Sciences

NS: Natural Sciences

Lab: College Laboratory or Field Experience HUM: Humanities



Benchmarks

B.S. @ BENCHMARK INSTITUTIONS

Institutions	QMI	QMII	EMI	EMII	Major Level Thermo or Statistical Mechanics
Michigan State	✓		✓		✓
Ohio State	✓	✓	✓		✓
University of Arizona	✓		✓	✓	✓
UC-Davis	✓	✓	✓	✓	✓
University of Florida	✓		✓	✓	✓
University of Iowa	✓	✓	✓	✓	✓
University of Michigan	✓		✓		✓
University of Minnesota – Twin Citites	✓		✓	✓	✓
University of North Carolina – Chapel Hill	✓		✓	✓	✓
University of Wisconsin - Madison	✓		✓		✓



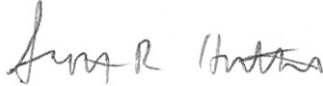
Letters

March 7, 2019

Dear Undergraduate Council,

On behalf of the faculty of the College of Arts and Sciences, the Education Policy Committee discussed and approved the changes to the BS in Physics 8:0:1 on Tuesday, March 5, 2019.

Sincerely,



Scott Hutson
Chair, Education Policy Committee



University of Kentucky
College of Arts and Sciences
Department of Physics and Astronomy

177 Chemistry-Physics Building
Lexington, KY 40506
phone: 859-257-6101
shapere@pa.uky.edu

17 February 2019

Re: Change in degree requirements for Physics B.S.

To Whom It May Concern:

The Department of Physics and Astronomy is requesting that PHY 522 “Thermodynamics and Statistical Physics” be added to the list of courses required for completion of the Bachelor of Science Degree in Physics. The proposed change was considered at a faculty meeting on April 30, 2018 and was unanimously approved by all faculty in attendance.

Sincerely,

A handwritten signature in black ink, appearing to read 'Alfred D. Shapere'.

Alfred D. Shapere
Chair, Department of Physics and Astronomy