

# Doctor of Philosophy - Astronomy

2 Graduate Program Change 2022-23

## I. General Information

The faculty member originating this proposal is to complete sections I and II.

Before starting this form, please review graduate curriculum website on policies and processes: <https://www.unlv.edu/graduatecollege/curriculum>

Click "**validate and launch proposal**" **button below.** Once the pop-up window comes up and displays an error message, click on the "show me" button (on the pop-up). This will highlight in red the required fields of this form. Fill in **ONLY** the red (required) fields.

With all red fields completed, click on the "**validate and launch proposal**" **button** again to launch the proposal. The pop-up this time should not display an error, and will display instead a "**launch proposal**" **button.** Click on the "**launch proposal**" **button** to launch.

**After launch, please fill in all remaining fields in the form to reflect your intended changes, including edits to the schema section of this form (further explained below).**

Department (s) (if Dual or Interdisciplinary please add all departments):\*

Physics and Astronomy

Degree or Certificate Name:\*

Doctor of Philosophy - Astronomy

Degree Type:\*

Doctor of Philosophy

Program Type:\*

Doctoral

## II. Program Changes

Proposed New CIP Code (if applicable):

Are you changing admission requirements?\*

Yes

No

Are you changing program learning objectives?  Yes  No

If yes, describe changes to learning objectives:

Are you changing course requirements?  Yes  No

Are you changing degree completion requirements?  Yes  No

Are you changing the culminating experience?  Yes (complete the culminating experience section below)  No

Other Changes (e.g. subplan titles,...):  Yes  No

If not a Dual itself, is this program also available as part of a Dual-Degree offering?  Yes  No

## Summary of Changes

**Provide a brief summary of proposed changes:** We propose to add AST 723 Astrophysical fluids and AST 729 Galaxies to the list of astronomy courses that students can choose from to meet the 9 credit astronomy course requirement

**Provide a rationale for each proposed change:** The course listed above were not regularly taught when the program was created but are now being offered on a regular basis

## Office of Online Education

Programs that are 100% online must contact the Office of Online Education (<https://www.unlv.edu/provost/online-education>).

Email: [elizabeth.barrie@unlv.edu](mailto:elizabeth.barrie@unlv.edu)

What is the current delivery/mode of instruction for this program?  100% face-to-face courses  Hybrid (some online courses; some face-to-face courses)  100% online courses

- Are you changing the delivery/mode of instruction? (select new mode):\*
- 100% face-to-face courses
  - Hybrid (some online courses; some face-to-face courses)
  - 100% online courses (contact office of online education)
  - No Changes

## Required Additional Documents:

Please attach required documents by navigating to the “attach a file” icon at the right of this form.

Information and forms available at the [Office of the Vice Provost for Academic Programs](#) website.

**If changing to 100% online delivery, please attach the following:**

Assessment Plan - A new assessment plan will be required when adding an exclusively online mode of delivery to a degree and it must be approved by the [Office of Academic Assessment](#), [assessment@unlv.edu](mailto:assessment@unlv.edu),

Dean's memo of support

Teach Out Plan (available at the [Office of the Vice Provost for Academic Programs](#) website).

- If 100% Online, attach the required documents and mark the checkboxes:
- Assessment Plan
  - Dean's memo of support
  - Teach Out Plan

## Office of Educational Compliance

Programs that lead to professional licensure or certification must contact the Office of Educational Compliance (<https://www.unlv.edu/provost/ed-compliance>).

Email: [leeann.fields@unlv.edu](mailto:leeann.fields@unlv.edu)

- With this change, does this program lead to professional licensure or certification?\*
- Yes (contact office of educational compliance)
  - No

## SCHEMA SECTION

**Please edit the schema section after launching the proposal. To launch, please complete all other fields of this form and click "validate and launch" at the bottom. If an error message pops up, please click "show me" and fill in all red (missing) fields in the form and click "validate and launch" again until successfully launched.**

In this section, please use the instructions below to change the graduate catalog display of program requirements: descriptions, admissions, courses, degree completion, graduation, etc.

Please note that the new graduate catalog will display the exact information that you edit in this section.

### INSTRUCTIONS:

1. Click on the "View Curriculum Schema" icon at the bottom of the "Schema Section."
2. If you are only adjusting existing content, click on the respective Core you would like to edit, then make your edits and click on "Save" as you go. If you are deleting a subplan or courses, simply delete the respective Cores or courses and adjust the descriptive content accordingly.

If you are adding new subplans and/or adding or substituting courses, please see the steps below:

**Prior to following the steps below, please open in parallel a structurally similar program from the graduate catalog as a reference ([UNLV Graduate Catalog](#)). You will use this reference to review the sections of a program plan, and have direction on expected content.**

3. Click "Add Core" to create blank "Cores." Create as many Cores as you will need. If unsure, refer to other subplans already in this program or to a reference in the graduate catalog to understand how many Cores you need and their expected content.
4. Click on each Core and rename them following your needs or a catalog reference, clicking on "Save" as you go.
5. Add content to all of the cores by clicking within the field to be edited and clicking "Save" as you go. Please note that course sections require instructions of how the credits must be taken (e.g. "Complete x credits by completing all of the following courses," or "Complete x credits of advisor-approved courses," or "Complete 3 credits of course-x and 6 credits of course-z," etc.).
6. To add courses, click on the "View Curriculum Courses" tab at the top of the schema window below, then click on the "Import Course" button at the bottom of the "View Curriculum Courses" window. Click on the available import catalog (only one will be available), and on the import window, select "filter by prefix." (1) Search for your desired course prefix; (2) then click "search available curriculum; (3) then click on all courses that will be imported. Add courses to proposal by clicking, at the very bottom, on the "Add Courses to Proposal" button. Repeat this process as often as you need until all courses are added to the proposal.
7. For courses that do not exist yet at the time of this proposal: Add the courses into the description box of the respective course section in the following way: "PREFIX - NUMBER - Course name, (credits)."
8. Add the courses into their respective course section by clicking "add course" within each course section.

**QUESTIONS?** Step-by-step guides are available at the [Graduate Curriculum Website](#), and at any time please contact [gradcurriculum@unlv.edu](mailto:gradcurriculum@unlv.edu)

## Plan Description

The purpose of the Astronomy M.S. and Ph.D. degrees are to prepare students for a career in Astronomy or Astrophysics Research or in education at the university level. The program achieves this with a custom program for each student set up by their advisor and their advising committee. In the case of the Ph.D. the research must be original research conducted independently by the student.

**For more information about your program, including your graduate program handbook and learning outcomes please visit the [Degree Directory](#).**

## Plan Admission Requirements

### [Application deadlines](#)

Applications available on the [UNLV Graduate College website](#).

Applicants must have a regionally accredited undergraduate degree or a Masters degree in Physics, Astronomy or related area.

Applicants must have a minimum GPA of 2.75 for all undergraduate work or a minimum 3.00 GPA for the last two years of undergraduate work.

Applicants seeking direct admission to the doctoral program without a previously earned Master of Science degree will preferably have a score in the 65th percentile or above on the Advanced Physics portion of the GRE before admission and have a minimum GPA of 3.00 for all undergraduate work or an overall 3.25 GPA for the last two years of undergraduate work.

Applicants with a Master's degree must have an overall 3.00 GPA in their Master's program and at least 15 credits of graduate-level course work in physics or astronomy with a grade of B or better. A student entering with a Master's degree will be required to complete at least 30 additional credits, including dissertation credits, beyond the Masters.

All domestic and international applicants must review and follow the [Graduate College Admission and Registration Requirements](#).

*Students are accepted into a degree program as described in the Graduate Catalog. The faculty and corresponding sub-disciplines and sub-plans within the described programs are subject to change at any time.*

## Plan Requirements

See *Subplan Requirements* below.

[Subplan 1: Post-Bachelor's](#)

[Subplan 2: Post-Master's](#)

## Subplan 1 Requirements: Post-Bachelor's

Total Credits Required: 60

## Course Requirements

### Required Courses – Credits: 9

AST 713 Astrophysics I	3
AST 714 Astrophysics II	3
PHYS 700 Mathematical Physics I	3

### Theory Course – Credits: 3

Complete one of the following courses:

PHYS 711 Electromagnetic Theory I	3
PHYS 721 Quantum Theory I	3
PHYS 702 Classical Mechanics I	3

### Astronomy Courses – Credits: 9

Complete three of the following courses:

AST 710 Observational Astronomy Techniques	3
AST 721 Astrophysics of Gaseous Nebulae and Active Galactic Nuclei	3

<b>AST 723 Astrophysical Fluids</b>	<b>3</b>
<b>AST 725 High Energy Astrophysics</b>	<b>3</b>
<b>AST 727 Cosmology</b>	<b>3</b>
<b>AST 729 Galaxies</b>	<b>3</b>
<b>AST 731 Stellar Atmospheres: Theory, Observation, and Analysis</b>	<b>3</b>
<b>AST 747 Interstellar Medium</b>	<b>3</b>
<b>PHYS 771 Advanced Topics in Experimental and Theoretical Physics</b>	<b>3</b>

### **Graduate Seminar Course – Credits: 6**

Complete 6 credits of the following course, including three acceptable presentations.

<b>PHYS 796 Graduate Seminar</b>	<b>1</b>
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### **Elective Courses – Credits: 15**

Complete 15 credits of 600- or 700-level AST or PHYS courses, or other advisor-approved courses.

### **Dissertation – Credits: 18**

<b>PHYS 799 Doctoral Dissertation</b>	<b>3 – 6</b>
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### **Degree Requirements**

The student must complete a minimum of 60 credits.

A minimum grade of B- is required in each course. An overall GPA of 3.00 or better is required in all course work which is part of the degree program.

Satisfactory performance on an astronomy qualifying examination on graduate astronomy knowledge. This requirement must be fulfilled by the second year in the program. Students who fail to pass the exam within the specified timeline will be placed on academic probation and will be allowed one retake of the exam. Failure to pass the retake or meet the requirements of academic probation will result in separation. A dissertation of high quality consisting of significant original research.

Satisfactory performance on a final examination which will consist of



an oral defense of the dissertation.

## Graduation Requirements

[See Plan Graduation Requirements below.](#)

## Subplan 2 Requirements: Post-Master's

Total Credits Required: 30

## Course Requirements

### Required Courses – Credits: 0-9

Complete 0-9 credits from the following list of courses:

<b>AST 713 Astrophysics I</b>	<b>3</b>
<b>AST 714 Astrophysics II</b>	<b>3</b>
<b>PHYS 700 Mathematical Physics I</b>	<b>3</b>

### Theory Course – Credits: 0-3

Complete 0-3 credits from the following list of courses:

<b>PHYS 702 Classical Mechanics I</b>	<b>3</b>
<b>PHYS 711 Electromagnetic Theory I</b>	<b>3</b>
<b>PHYS 721 Quantum Theory I</b>	<b>3</b>

### Astronomy Courses – Credits: 0-9

Complete 0-9 credits from the following list of courses:

<b>AST 710 Observational Astronomy Techniques</b>	<b>3</b>
<b>AST 721 Astrophysics of Gaseous Nebulae and Active Galactic Nuclei</b>	<b>3</b>
<b>AST 725 High Energy Astrophysics</b>	<b>3</b>
<b>AST 727 Cosmology</b>	<b>3</b>

<b>AST 731 Stellar Atmospheres: Theory, Observation, and Analysis</b>	<b>3</b>
<b>AST 747 Interstellar Medium</b>	<b>3</b>
<b>PHYS 771 Advanced Topics in Experimental and Theoretical Physics</b>	<b>3</b>
<b>AST 723 Astrophysical Fluids</b>	<b>3</b>
<b>AST 729 Galaxies</b>	<b>3</b>

### **Seminar Course – Credits: 0-6**

Complete 0-6 credits of the following, including three acceptable presentations.

<b>PHYS 796 Graduate Seminar</b>	<b>1</b>
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### **Dissertation – Credits: 18**

<b>PHYS 799 Doctoral Dissertation</b>	<b>3 – 6</b>
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### **Degree Requirements**

Students must take an advisor approved combination of the coursework listed above, completing a minimum of 30 credits. Additional credits may be required to address student deficiencies or build specialized expertise.

The total number of Required, Theory, Astronomy, and Seminar courses will be determined in consultation with the student's advisor. A minimum grade of B- is required in each course. An overall GPA of 3.00 or better is required in all course work which is part of the degree program.

Satisfactory performance on an astronomy qualifying examination on graduate astronomy knowledge. This requirement must be fulfilled by the second year in the program. Students who fail to pass the exam within the specified timeline will be placed on academic probation and will be allowed one retake of the exam. Failure to pass the retake or meet the requirements of academic probation will result in separation. A dissertation of high quality consisting of significant original research.

Satisfactory performance on a final examination which will consist of an oral defense of the dissertation.

## Graduation Requirements

[See Plan Graduation Requirements below.](#)

## Plan Graduation Requirements

The student must submit all required forms to the Graduate College as well as apply for graduation up to two semesters prior to completing their degree requirements.

The student must pass a qualifying exam and submit and successfully defend their dissertation by the posted deadline. The defense must be advertised and is open to the public.

After the dissertation defense, the student must electronically submit a properly formatted pdf copy of their dissertation to the Graduate College for format check. Once the dissertation format has been approved by the Graduate College, the student will submit the approved electronic version to ProQuest. Deadlines for dissertation defenses, format check submissions, and the final ProQuest submission can be found [here](#).

## Advising and Culminating Experience

With these changes, will students in this program need a Grad Advisory Committee (GAC) formed?  Yes  No

If yes, please list the applicable subplans that will need a GAC:

With these changes, will students be assigned a faculty advisory prior to GAC formation?  Yes  No

If yes, please list the applicable subplans that will need an advisor:

Comments:

For Master's program only: With these changes, does this program require a prospectus form?

- Yes  
 No

If yes, please list applicable subplans:

With these changes, will the culminating experience be a course?

- Yes  
 No

If yes, please provide course prefix, number and name:

With these changes, describe the culminating experience (requirements, if applicable-which subplans will need GACs, forms, etc.):

The [Degrees Directory](#) provides current and consistent degree information. Submission of this form indicates acknowledgment and understanding that every department is responsible creating and maintaining accurate and updated program information on the UNLV Degrees Directory.

If new courses are added as placeholders within this proposal, new courses must be created using a Course Create form simultaneously to the process of this proposal.

**Degrees Directory Program Entry:**  Check this box to acknowledge the above statement.

**Changes will be applicable to:**

Current Students  
 New Students  
 Both Current and New Students

**If applicable to current students, changes are:**

Mandatory     Optional



**If mandatory:**


If mandatory, I confirm that all students will be notified in writing of these changes as approved by the graduate college  
 Not Mandatory

**Effective Date:**

## READY TO SUBMIT?

After making all your intended changes, please follow these steps:

1. Finish the launch of your proposal by clicking the decisions icon  located to the right of the form. This will display a new decision/approval field on the top right.
2. Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.
3. Please note that it is your responsibility as the proposer to see that the proposal is reviewed and receives all necessary approvals. Please be encouraged to reach out to reviewers on each step, if necessary.
4. You can check the status of the proposal by clicking on the workflow status icon  to verify that the proposal has gone to the next step.

The workflow status icon  will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

QUESTIONS? contact [gradcurriculum@unlv.edu](mailto:gradcurriculum@unlv.edu)


### III. Department Vote Information

Note: This section is to be filled out by the Department Chair on behalf of the department committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify [gradcurriculum@unlv.edu](mailto:gradcurriculum@unlv.edu)).

1. Review the proposal. Discuss and make appropriate revisions.
2. Fill in vote information in the fields below, along with the approval. If Dual or Interdisciplinary: add votes from all departments/colleges involved

3. Then approve/reject by clicking the decisions icon  located to the right of the form. This will display a new decision/approval field on the top right. Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.

The workflow status icon  will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

If there were any modifications to the proposal, please enter them in the comments box below:

**Comments:**

**Date faculty voted on proposal:** 1/13/2022


**Result of vote:** 10-0


**Manner of vote:** online

#### IV. College Vote Information

**Note:** This section is to be filled out by the Academic Associate Dean on behalf of the college/school committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify [gradcurriculum@unlv.edu](mailto:gradcurriculum@unlv.edu)).

1. Review the proposal. Discuss and make appropriate revisions.
2. Fill in vote information in the fields below, along with the approval. If Dual or Interdisciplinary: add votes from all departments/colleges involved
3. Then approve/reject by clicking the decisions icon  located to the right of the form. This will display a new decision/approval field on the top right. Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.

The workflow status icon  will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

**Date faculty voted on proposal:** 3/22/2022

**Result of vote:** 5-0

**Manner of vote:** online

#### V. Graduate College Use Only - Code Request Items

**Note:** This section is for graduate college use only.

**Academic Organization:**

**Academic Program Code:**

**Academic Plan Code:**

**Plan Description (30  
chars):**

**Transcript  
Description:**

**Subplan Code:**

**Subplan Description:**

**Subplan Type:**  Track  
 Concentration  
 Option/Dual  
 Embedded/Track

**Subplan on  
Transcript?**  YES  NO

**Effective Date and  
First Term Valid:**

**Length / Avg. Time to  
Degree:**

**CIP code and title:**

**Other Codes Needed:**

**Description /  
implementation field  
(do not edit)**

## Comments for Doctor of Philosophy - Astronomy

<b>Curriculog</b>	3/22/2022 4:14 pm <a href="#">Reply</a>
Andrew Andres has approved this proposal on School/College Associate Dean/ Dean.	
<b>Rohan Dalpatadu</b>	3/22/2022 1:37 pm <a href="#">Reply</a>
Approved 5-0-0	
<b>Curriculog</b>	3/22/2022 1:37 pm <a href="#">Reply</a>
Rohan Dalpatadu has approved this proposal on School/College Committee.	
<b>Curriculog</b>	3/21/2022 2:37 pm <a href="#">Reply</a>
Physics Chair has approved this proposal on Department Chair.	
<b>Curriculog</b>	3/21/2022 11:48 am <a href="#">Reply</a>
Physics Graduate Coordinator has approved this proposal on Graduate Coordinator.	
<b>Curriculog</b>	2/11/2022 2:11 pm <a href="#">Reply</a>
Graduate Curriculum has approved this proposal on Technical Review.	
<b>George Rhee</b>	1/14/2022 2:56 pm <a href="#">Reply</a>
This is a very minor change. Adding two graduate astronomy classes to the options students have to chose from to meet the astronomy graduate class requirement.	
<b>Curriculog</b>	1/14/2022 2:56 pm <a href="#">Reply</a>
George Rhee has approved this proposal on Originator.	
<b>Curriculog</b>	1/14/2022 2:55 pm <a href="#">Reply</a>
George Rhee has launched this proposal.	
<b>Curriculog</b>	1/14/2022 2:43 pm <a href="#">Reply</a>
George Rhee imported from the map 2022-2023 - Working Graduate Catalog into the following proposal fields: I. General Information: Department (s) (if Dual or Interdisciplinary please add all departments);, I. General Information: Degree or Certificate Name;:, I. General Information: Degree Type;:, I. General Information: Program Type;:, II. Program Changes: Proposed Curriculum;:, V. Graduate College Use Only - Code Request Items: Description / Implementation field (do not edit).	



