

# NASA's Asteroid Data Hunter User Guide

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## **1. Preface**

### **1.1 About This Guide**

Welcome to the Asteroid Data Hunter Application user guide. Please use this guide as a starting point and reference for all functions and capabilities of the Asteroid Data Hunter Application.

### **1.2 Intended Audience**

This guide is intended for the end user of the Asteroid Data Hunter Application. As such, it will address basic functionality and intended use of the Asteroid Data Hunter Application.

### **1.3 Revision History**

This is the first revision of the end-user manual for the Asteroid Data Hunter Application.

## **2. Installation Procedures for Windows**

### **2.1 Prerequisites**

Please make sure the following prerequisites have been met:

- Must be run on Windows 7 or higher (using Parallels on a Mac will not work)
- Your computer must have at least 3 GB of ram.

### **2.2 Security**

If you're using windows, your computer may:

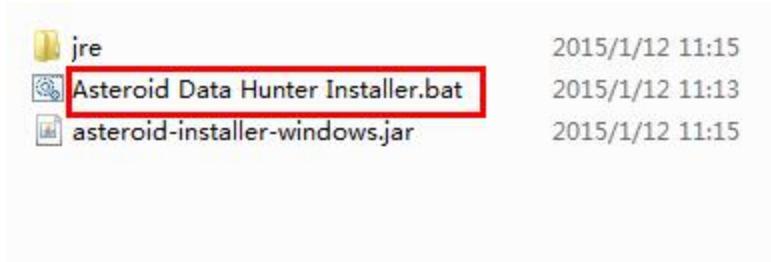
1. Inform you that you can't install the program to a specific area because it's been downloaded from the Internet - in which case, we suggest you install it to a folder on your desktop.
2. Inform you to "Unblock" the app so that it can be installed - please confirm and or unblock that app so that it can properly be installed.

Please note that this is an artifact of your computers setting, and not all computers will display these messages.

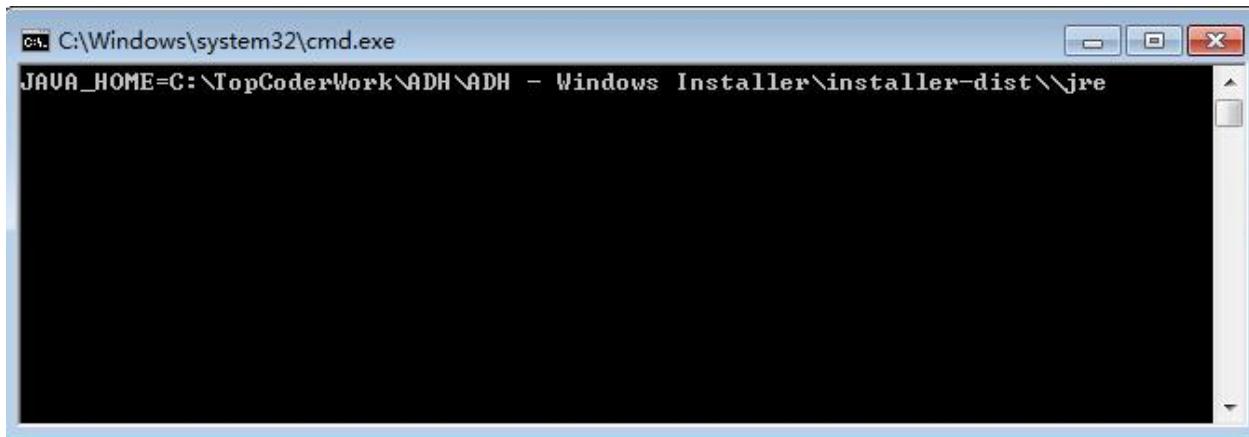
### **2.3 Installation**

The installation for the application is pretty straight forward. It is assumed that the user is using Windows 7 or above, and the machine has at least 3GB of RAM.

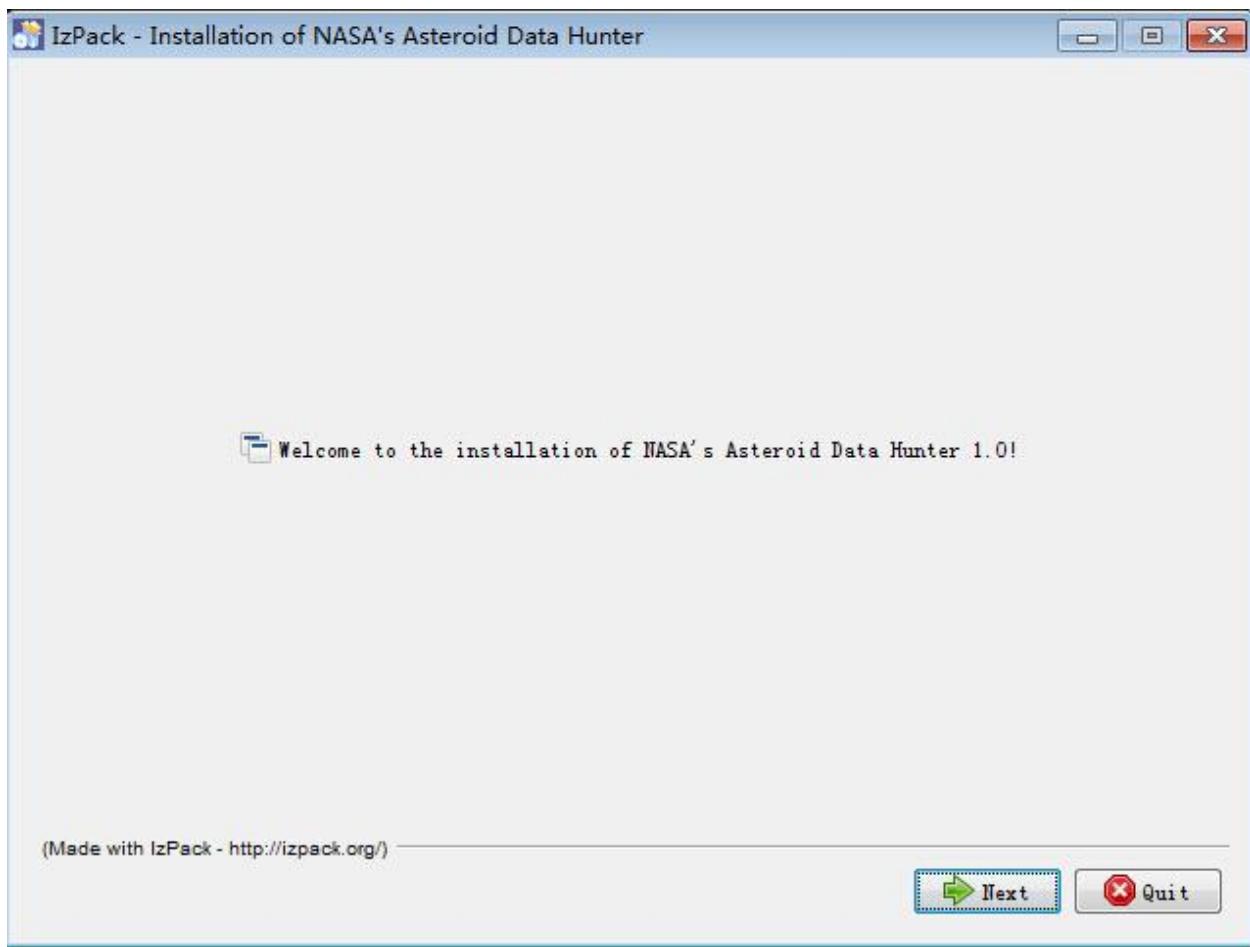
Once you get the installation file "**ADH - Windows Installer.zip**", please unzip it to your desktop, then go into its sub directory "**installer-dist**", and double click "**Asteroid Data Hunter Installer.bat**" to initiate the installation process.



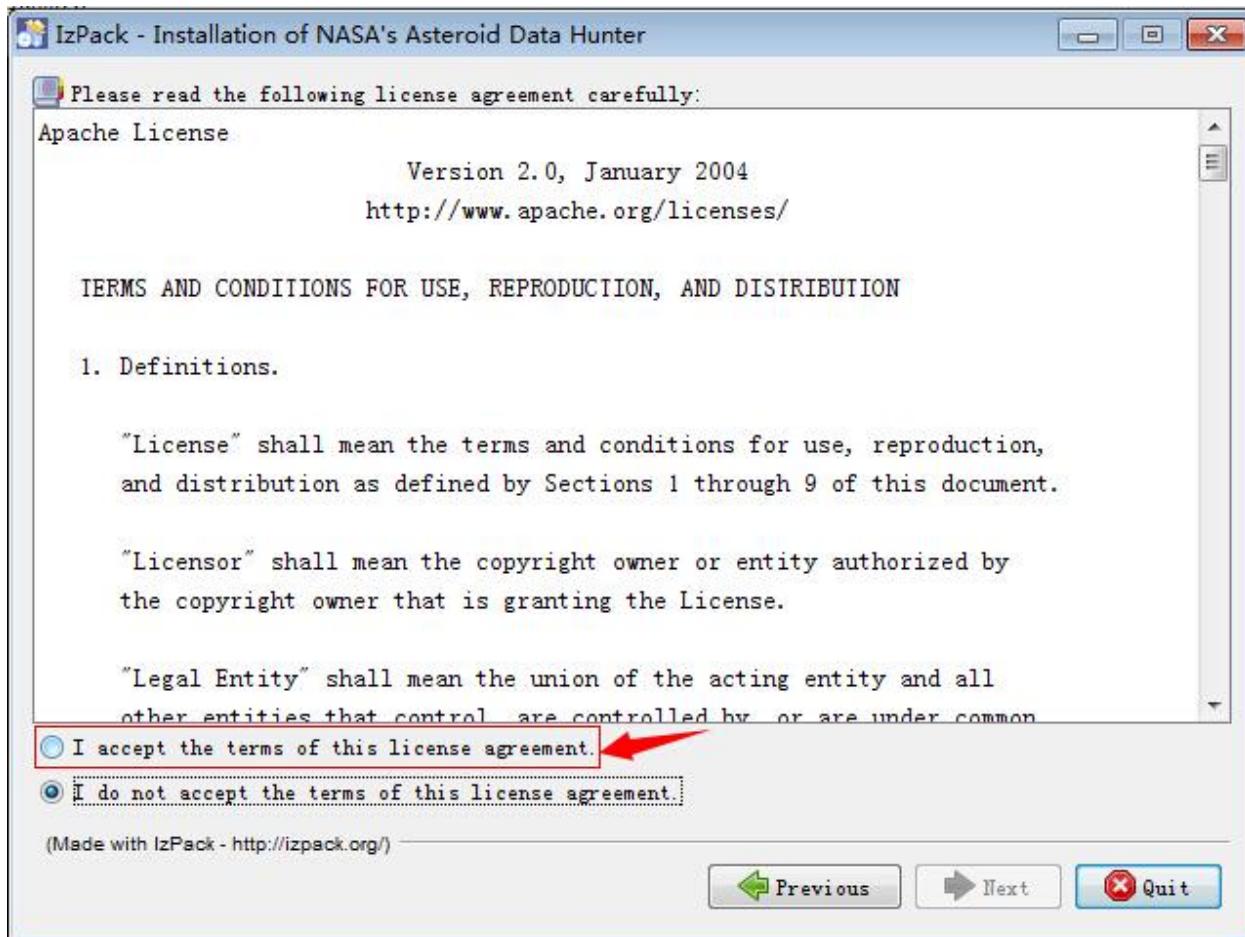
It will start the command line tool.

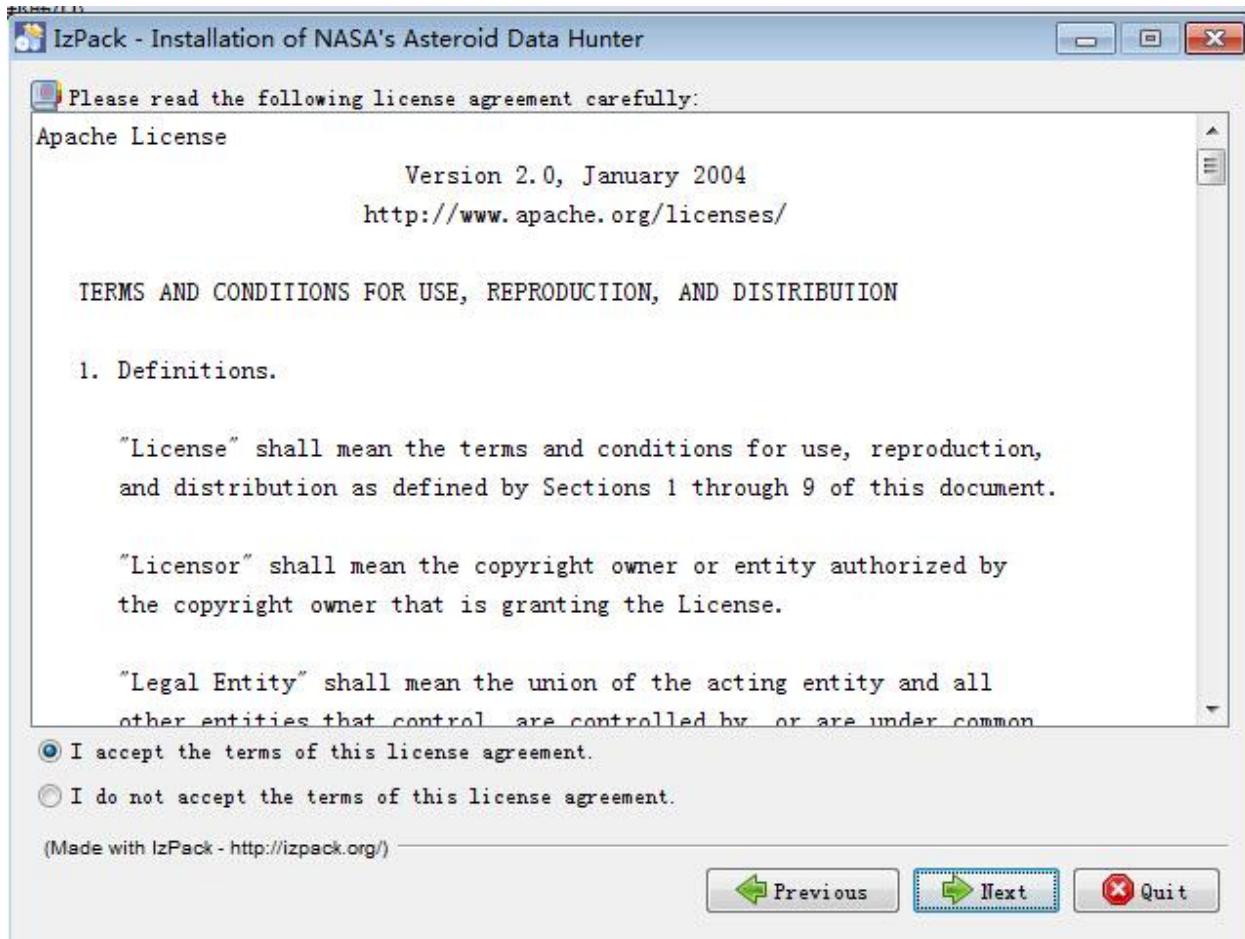


Then the installation start page will be presented.

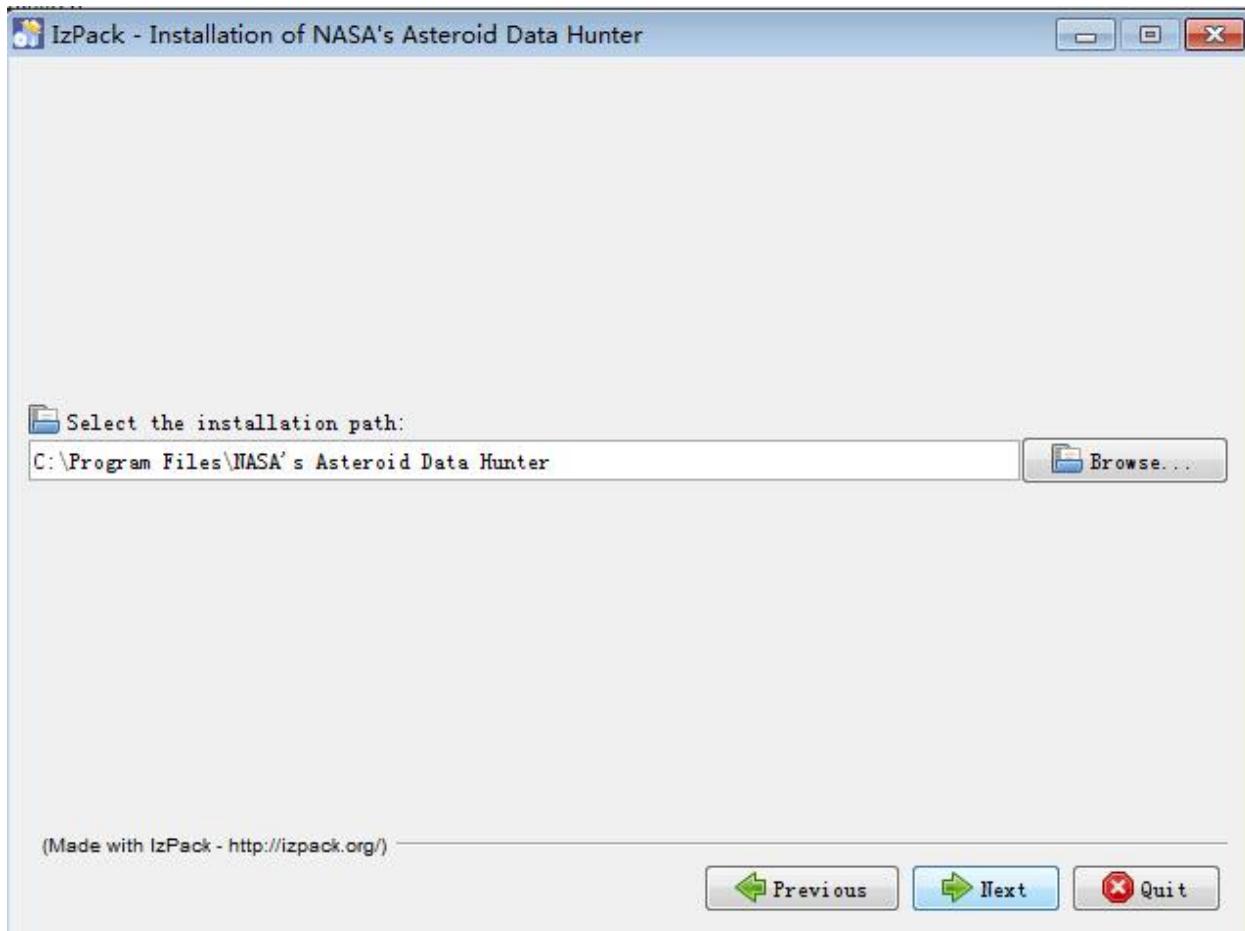


Click the "Next" button twice, you'll see the license agreement page. By default, the "Next" button is disabled. You have to check the "I accept the terms of this license agreement" option to enable the "Next" button.

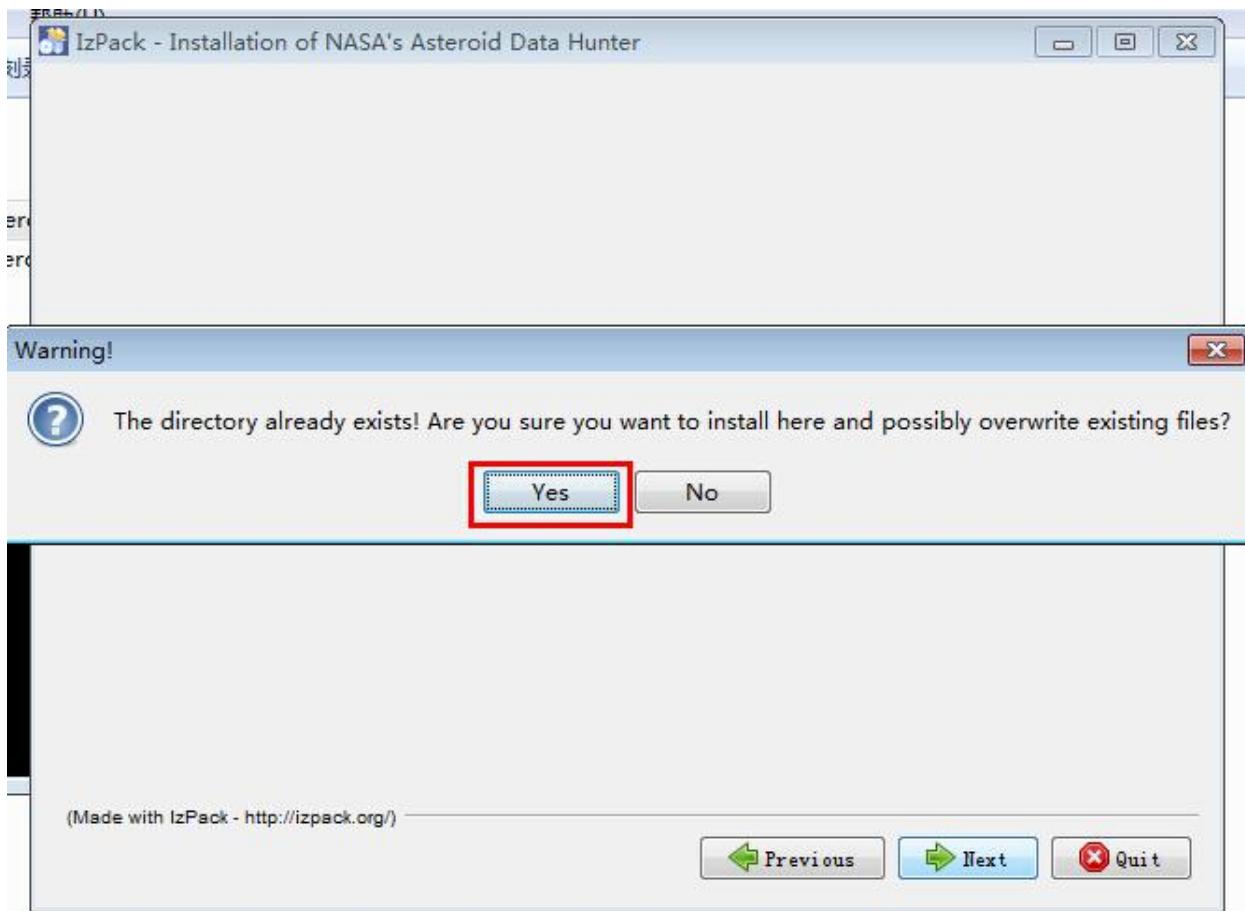




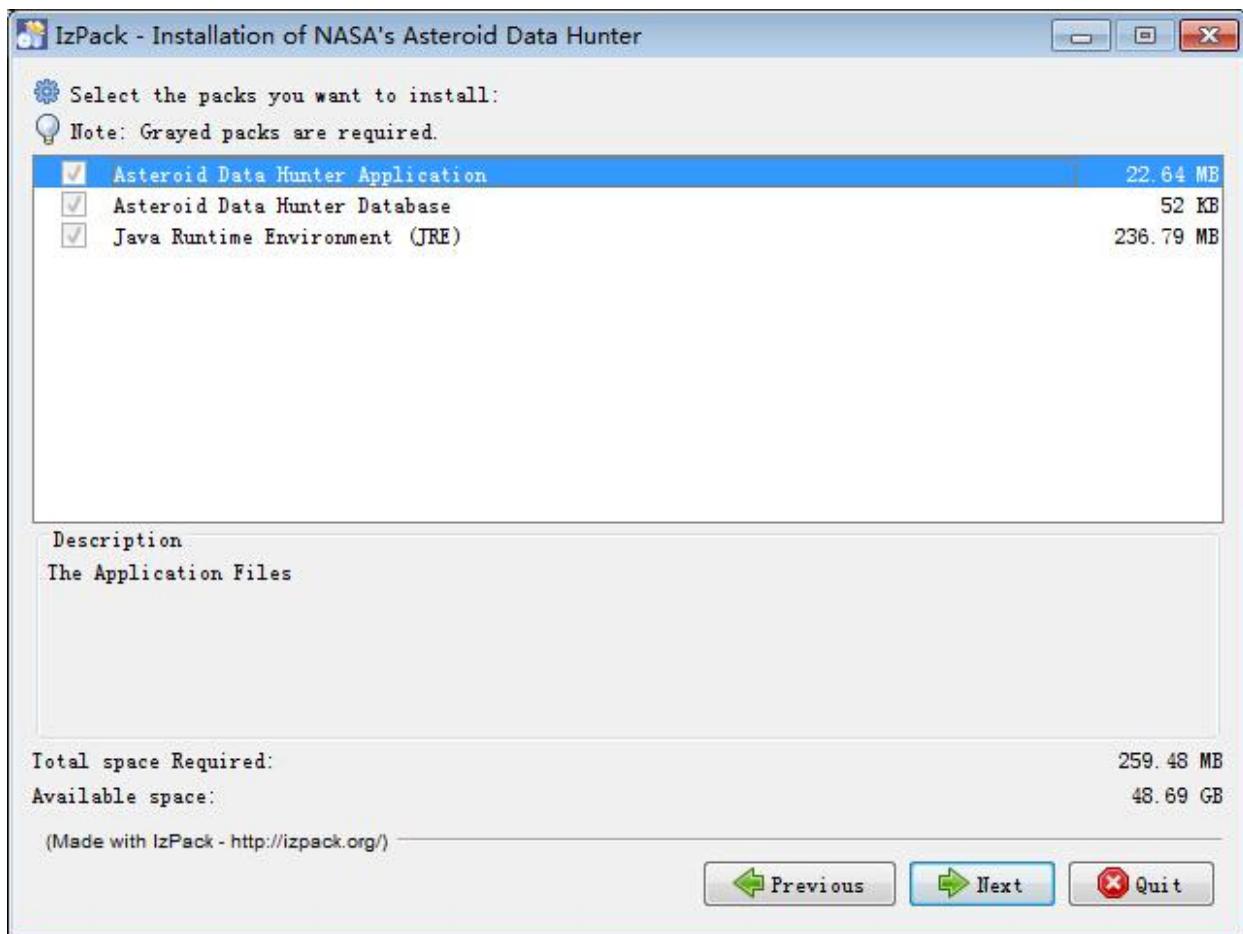
Click the "Next" button to proceed. Then it will allow the user to select the installation path. Click the "Browse..." button to change the installation path.



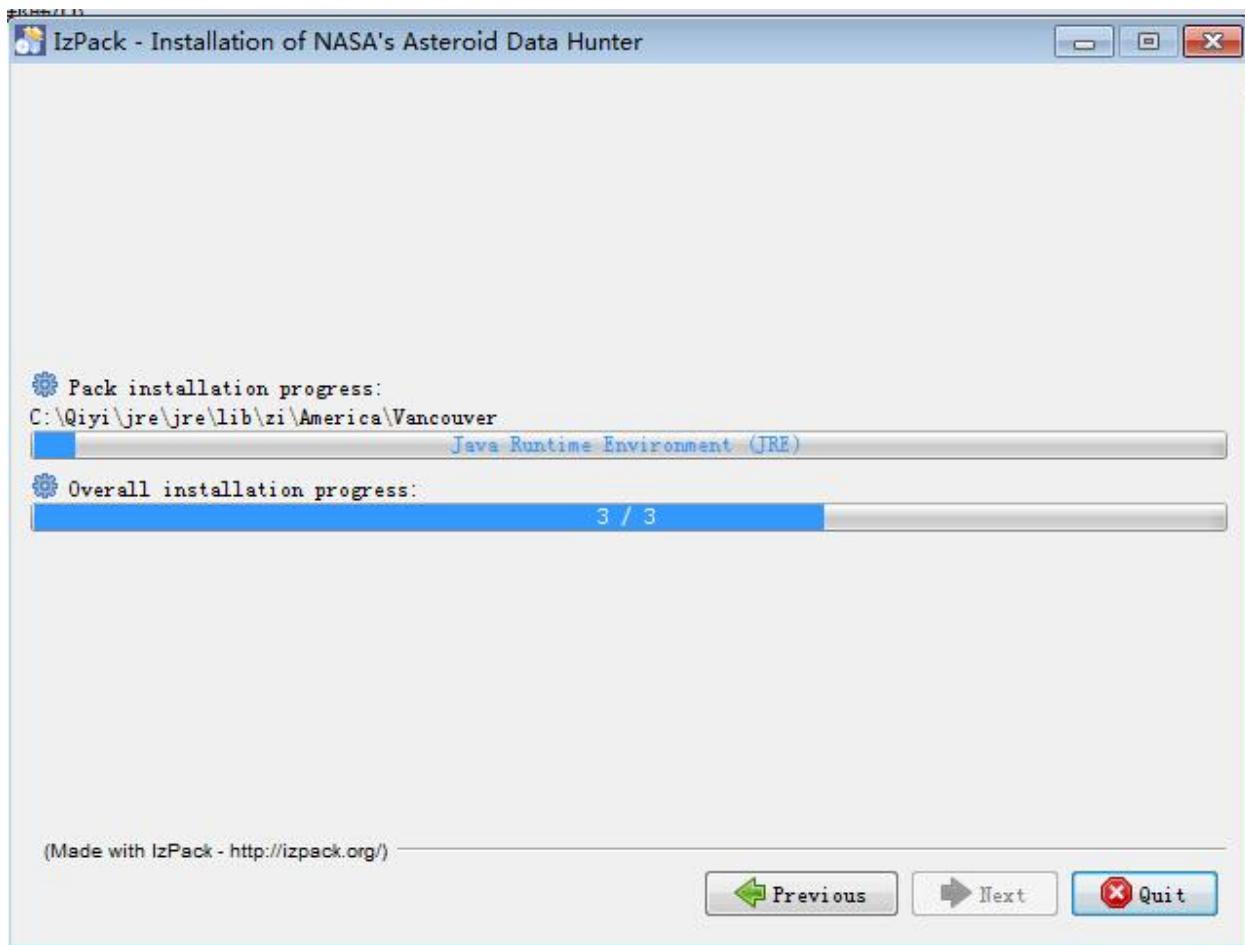
After selecting a path (e.g. C:\NASA), click the "Next" button. It will display a warning popup, click "Yes". Then the warning popup will be dismissed.

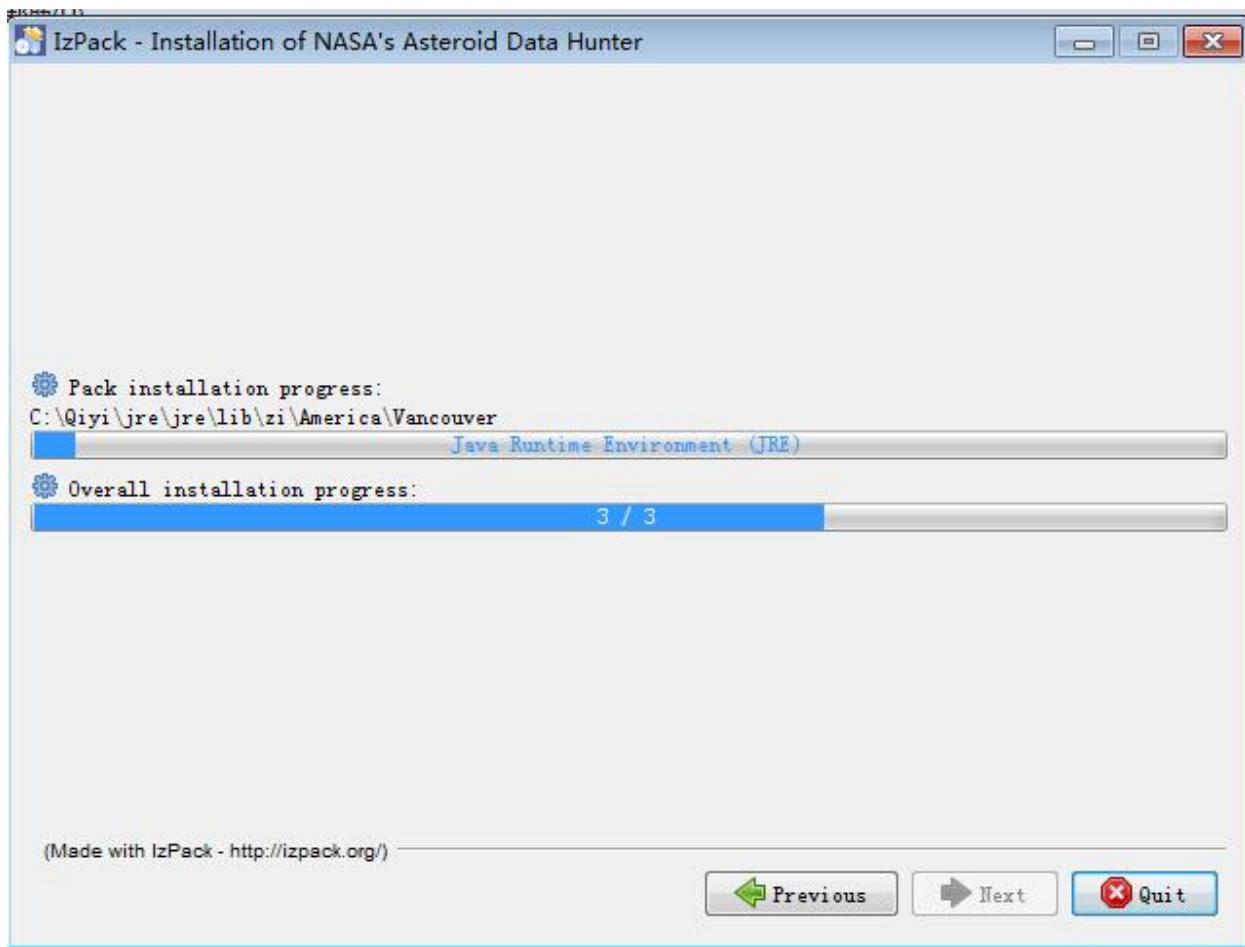


Click the "Next" button. It will display pre-selected packs which need to be installed.

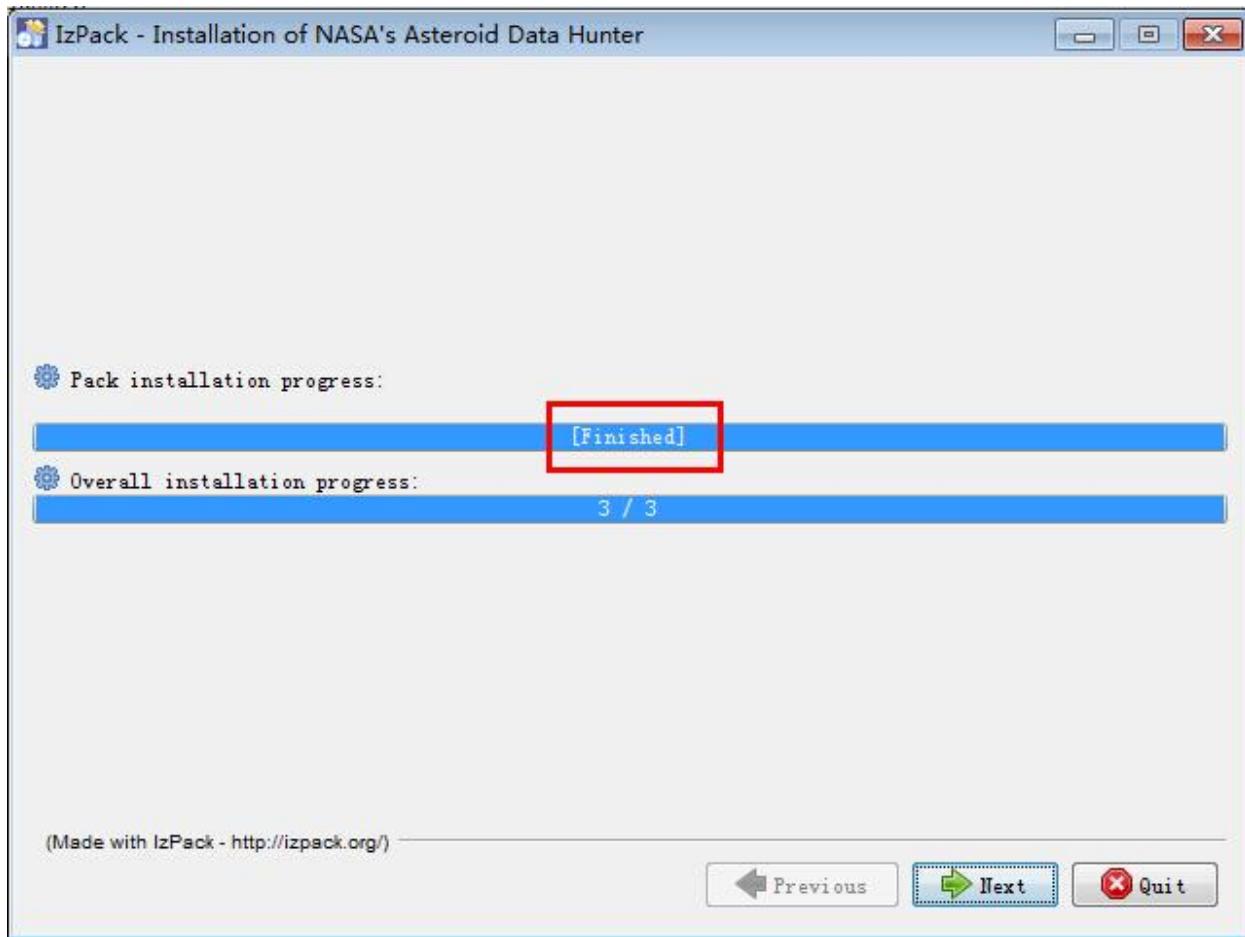


Click the "Next" button. It will start to install the app. The progress screen looks like:





Wait for several minutes, once it is done installing, you'll see the success message.



Optionally, you can click the "Next" button to set shortcuts or just click the "Quit" button to quit the installation.

You can see that the application is installed under the chosen path. Go into the chosen path ("C:\NASA" in this case), the installed files and folders look like below:

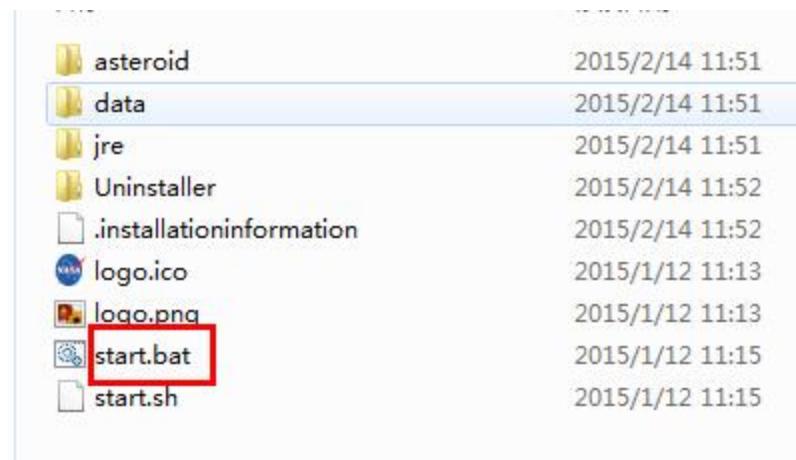
	asteroid	2015/2/14 11:51
	data	2015/2/14 11:51
	jre	2015/2/14 11:51
	Uninstaller	2015/2/14 11:52
	.installationinformation	2015/2/14 11:52
	logo.ico	2015/1/12 11:13
	logo.png	2015/1/12 11:13
	start.bat	2015/1/12 11:15
	start.sh	2015/1/12 11:15

## **2.4 Uninstall the Application**

To uninstall the application, navigate to the folder where you installed the app. Go to the “Uninstall” sub-directory and click “Uninstaller.jar” to un-install the app.

## **2.5 Run the Application**

Once the application is installed, it's time to run it. Go into the installation path, then double click the "start.bat" file to run the application.



It will start the command line tool and then the application will be opened in the default browser.

**NOTE: Please make sure to keep the command line window open when using the app, otherwise the app will not function.**

## **3. Installation Procedures for Mac**

### **3.1 Prerequisites**

Please make sure the following prerequisites have been met:

- Must be run on Mac OS 10.10.2 or higher
- Your computer must have at least 3 GB of ram.

### **3.2 Security**

If you're using windows, your computer may:

3. Inform you that you can't install the program to a specific area because it's been downloaded from the Internet - in which case, we suggest you install it to a folder on your desktop.
4. Inform you to “Unblock” the app so that it can be installed - please confirm and or unblock that app so that it can properly be installed.

Please note that this is an artifact of your computers setting, and not all computers will display these messages.

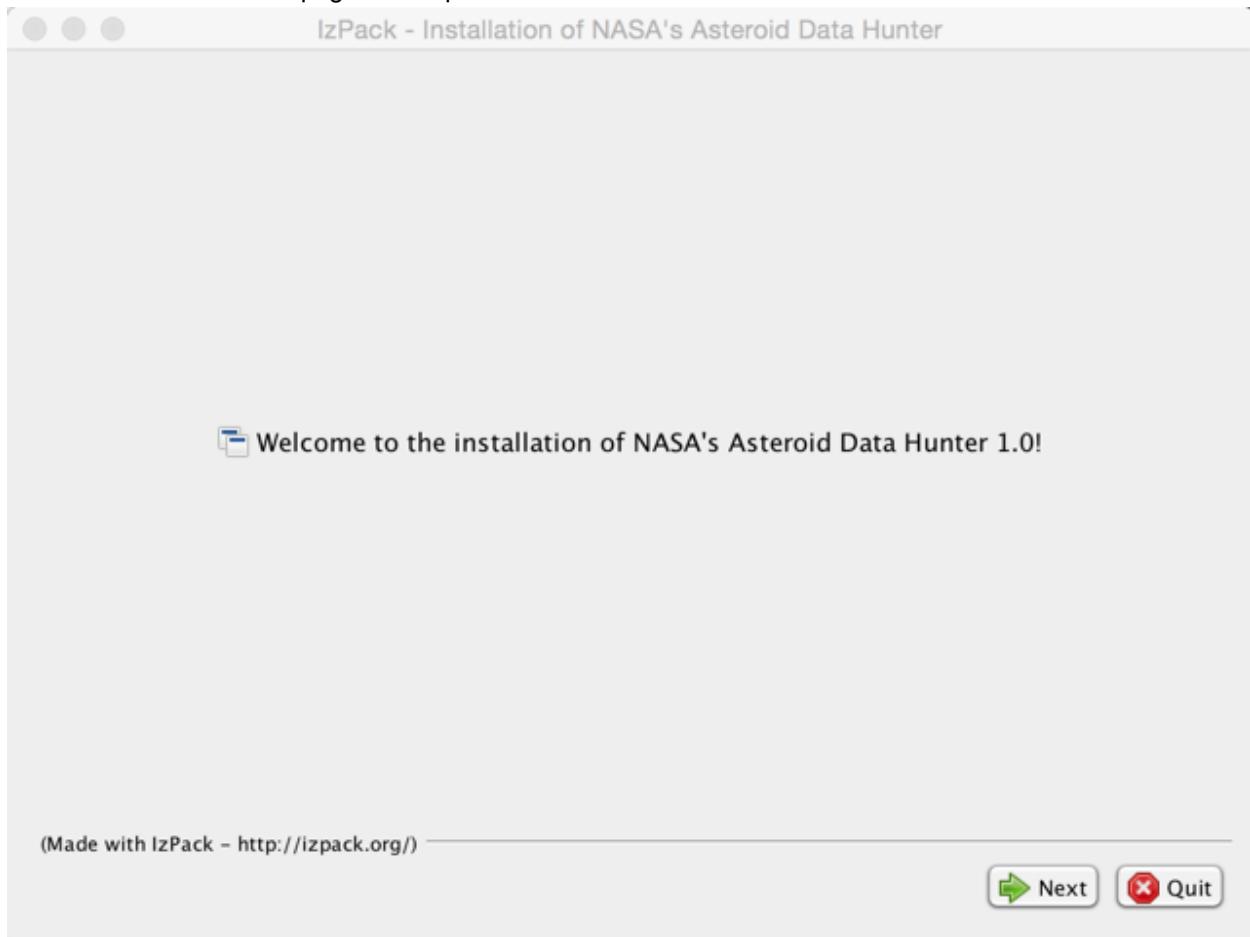
### **3.3 Installation**

The installation for the application is pretty straight forward. It is assumed that the user is using Mac OS 10.10.2 or above, and the machine has at least 3GB of RAM.

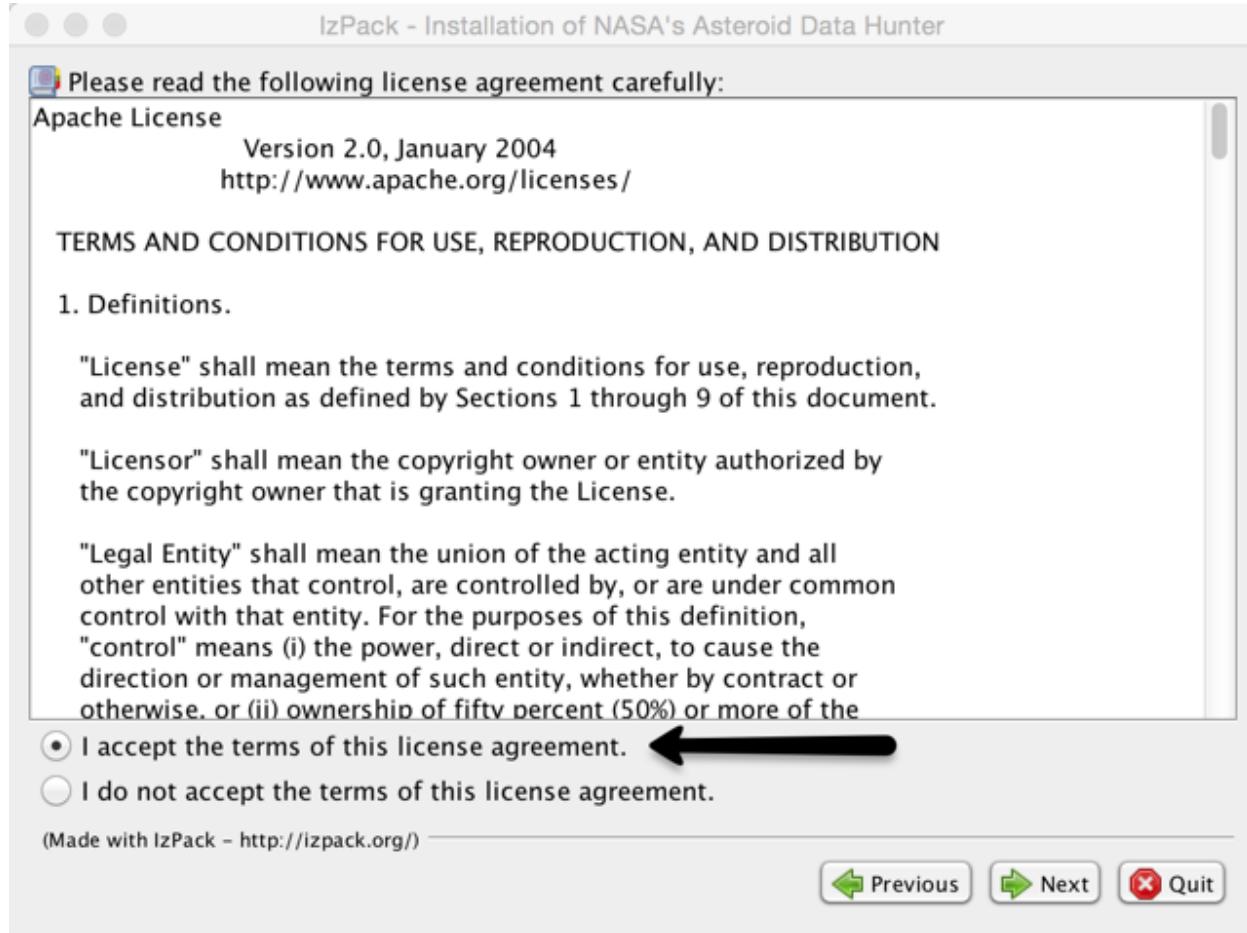
Once you've downloaded the installation file, please unzip it to your desktop, then go into its sub directory and double click "**asteroid-installer-linux.jar**" to initiate the installation process.

Name	Date Modified	Size	Kind
Asteroid_Data_Hunter_Installer.sh	Mar 12, 2015, 5:33 PM	349 bytes	shell script
<b>asteroid-installer-linux.jar</b>	<b>Mar 12, 2015, 5:33 PM</b>	<b>88.3 MB</b>	<b>Java archive</b>
jre	Yesterday, 1:45 PM	--	Folder

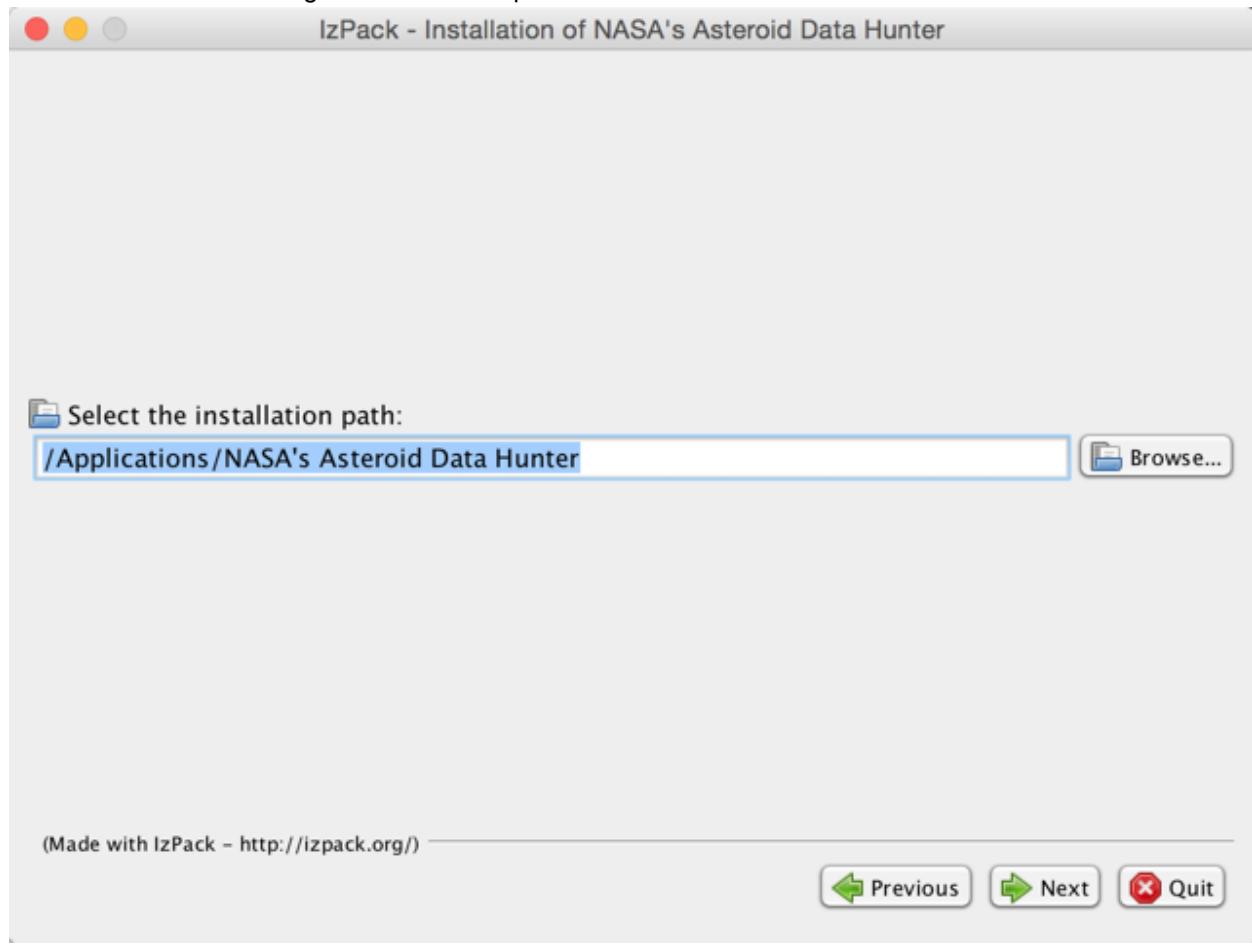
Then the installation start page will be presented.



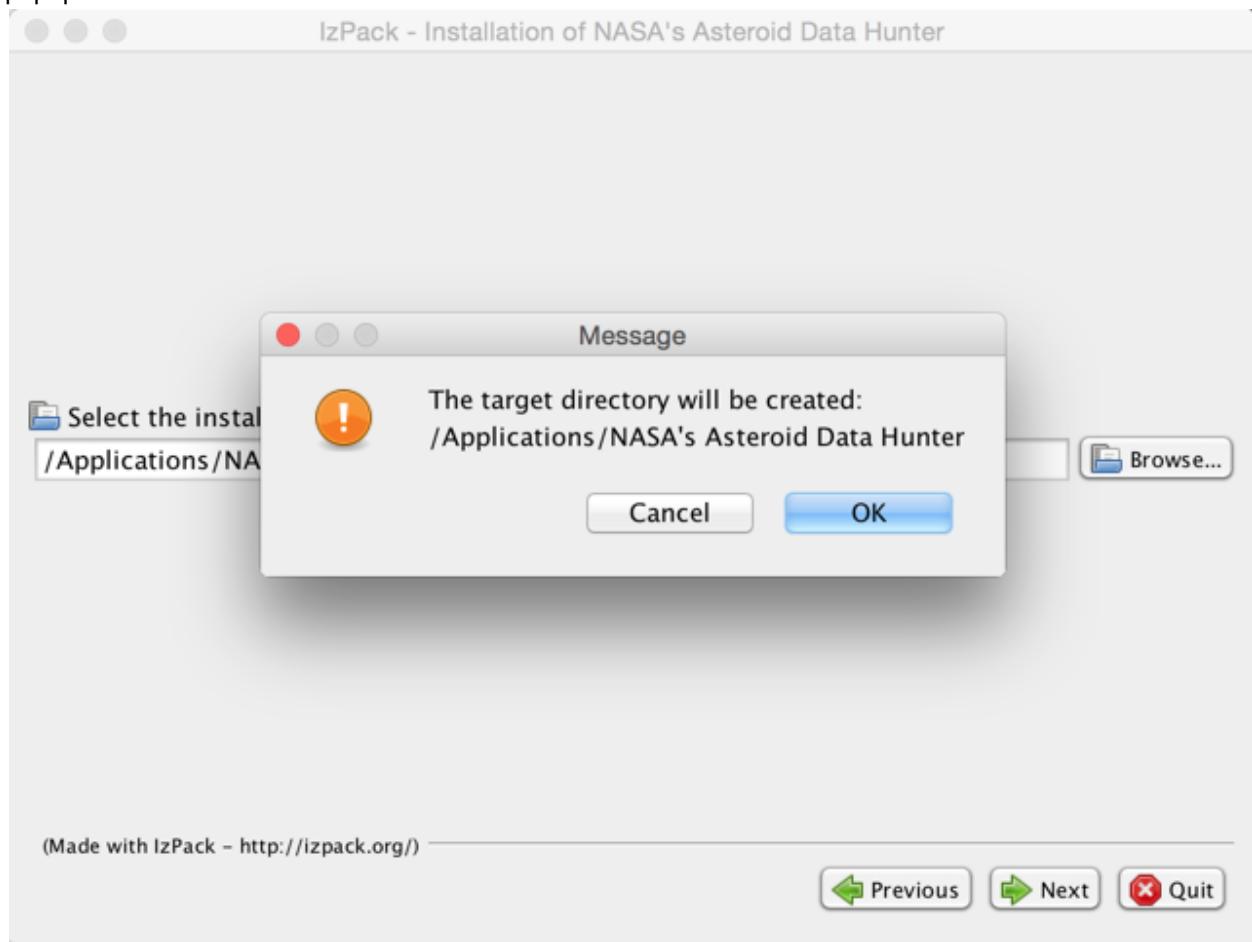
Click the "Next" button twice, you'll see the license agreement page. By default, the "Next" button is disabled. You have to check the "I accept the terms of this license agreement" option to enable the "Next" button.



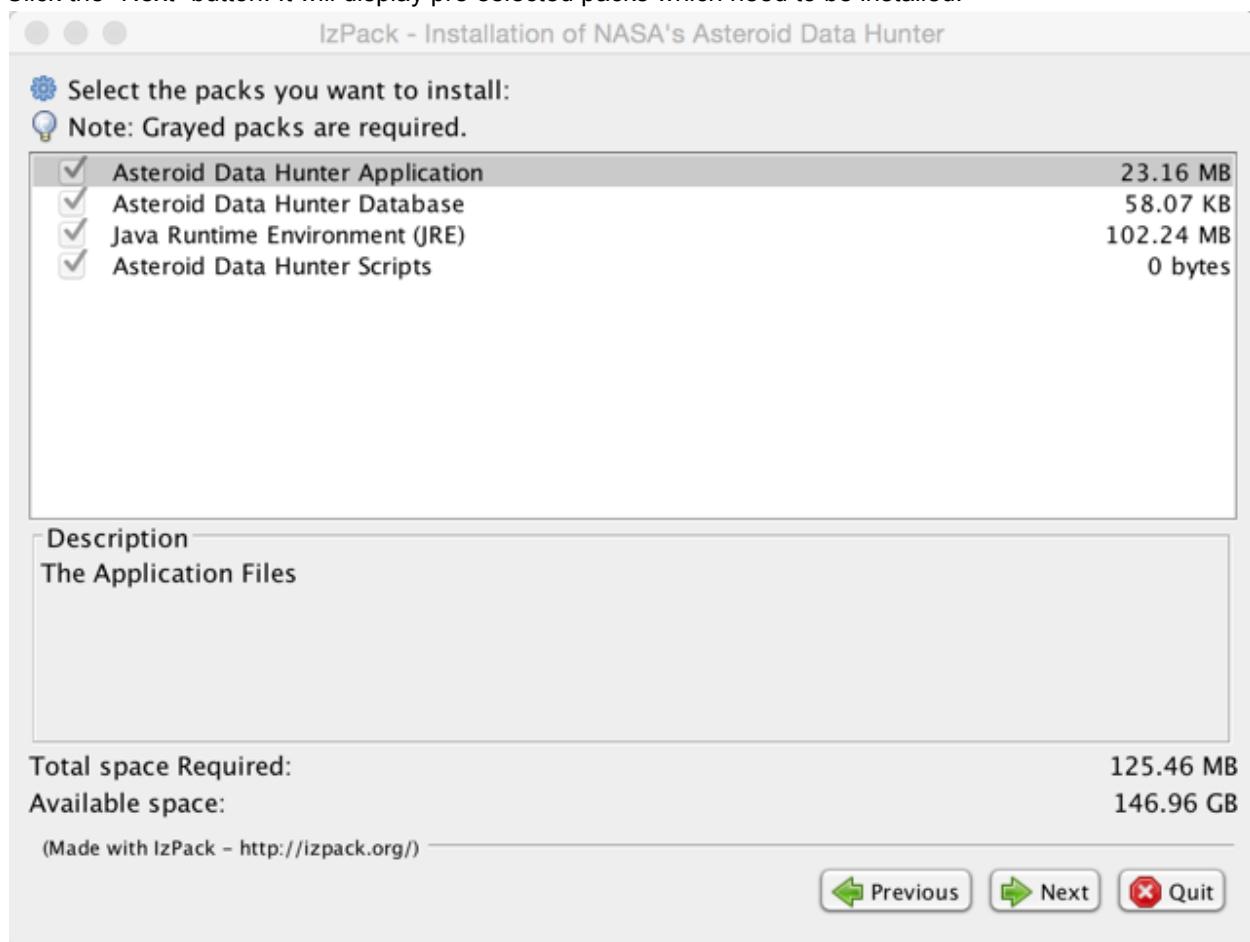
Click the "Next" button to proceed. Then it will allow the user to select the installation path. Click the "Browse..." button to change the installation path.



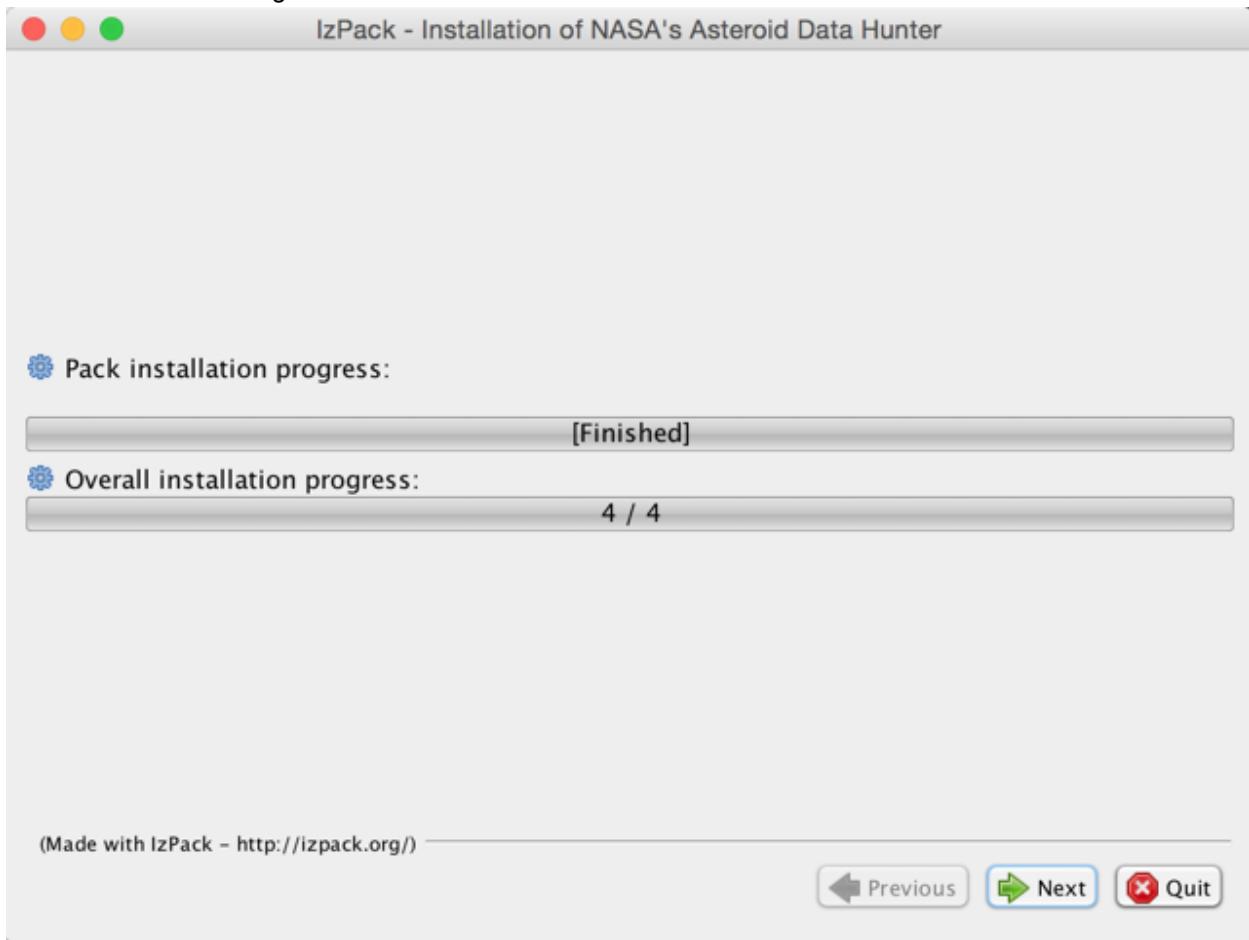
After selecting a path, click the "Next" button. It will display a warning popup, click "Yes". Then the warning popup will be dismissed.



Click the "Next" button. It will display pre-selected packs which need to be installed.



Click the "Next" button. It will start to install the app. Wait for several minutes, once it is done installing, you'll see the success message.



### 3.4 Uninstall the Application

To uninstall the application, navigate to the Application folder, and remove the directory where you installed the application.

### 3.5 Run the Application

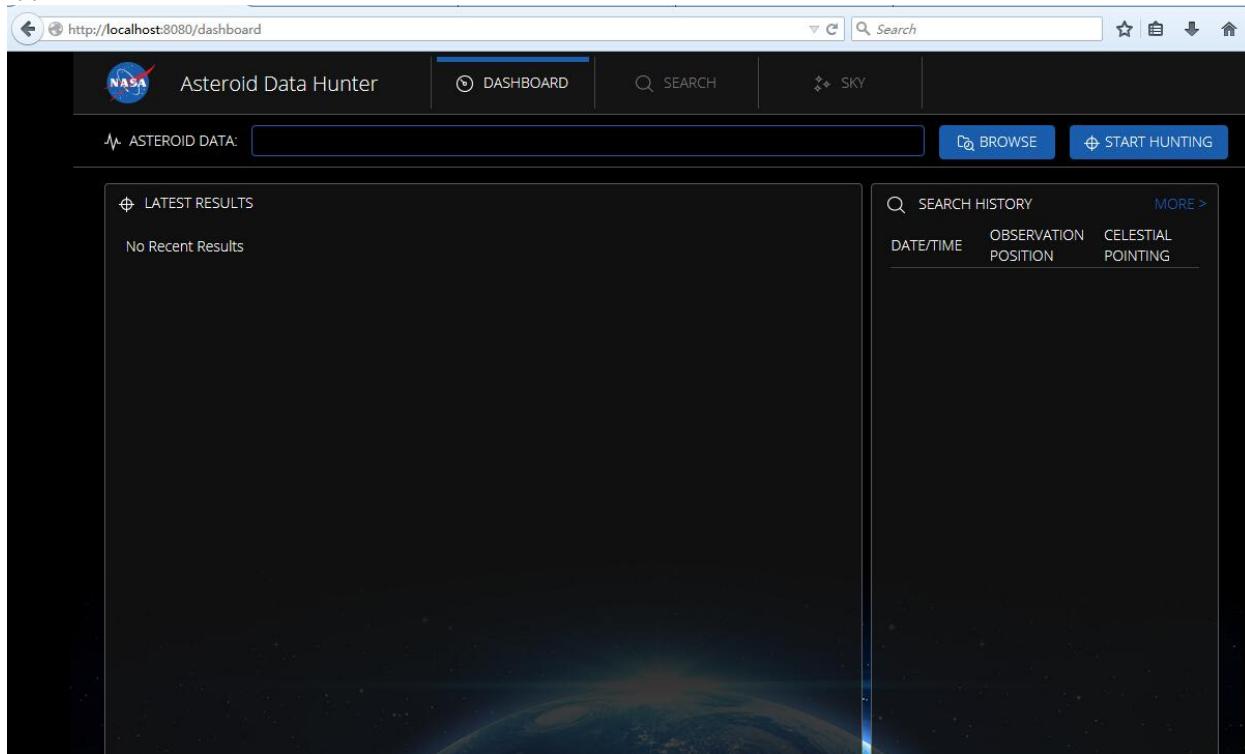
Once the application is installed, it's time to run it. Go to Finder, and enter "Terminal". The Terminal app will then launch. Go to the Applications folder, locate the app folder, grab start.bat, and drag "start.bat" into the terminal window. This will then launch the application within your default browser.

Name	Date Modified	Size	Kind
▶ asteroid	Mar 14, 2015, 9:30 PM	--	Folder
▶ data	Mar 14, 2015, 9:30 PM	--	Folder
▶ jre	Mar 14, 2015, 9:30 PM	--	Folder
NASA logo.ico	Mar 12, 2015, 4:33 AM	100 KB	Windo...image
NASA logo.png	Mar 12, 2015, 4:33 AM	4 KB	PNG image
start.bat	Mar 12, 2015, 4:33 AM	1 KB	Document
start.sh	Mar 12, 2015, 4:33 AM	1 KB	shell script
▶ Uninstaller	Mar 14, 2015, 9:30 PM	--	Folder

**NOTE: Please make sure to keep the terminal window open when using the app, otherwise the app will not function.**

### 4. View Dashboard (Application Homepage)

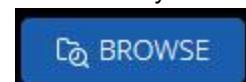
The homepage will be displayed after launching the application. There will be 3 tabs available: DASHBOARD, SEARCH and SKY. The default tab is "DASHBOARD", which is the homepage of the application.



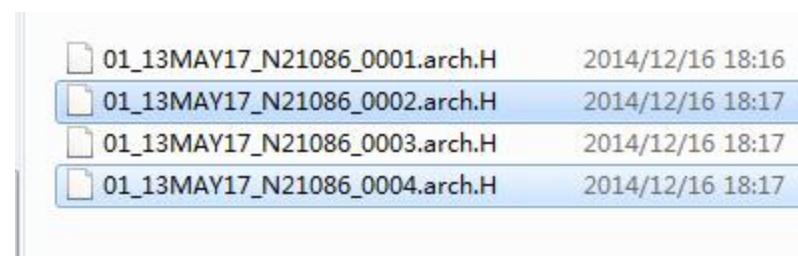
**NOTE: The app does not come pre-bundled with test data. To download test images / data, please use the "Test Images" link [here](#).**

## 4.1 Select Data Files to Hunt

The user can click the "BROWSE" button to select data files to hunt data. It is required that the user has to select exactly 4 files one time.



In order to select multiple files, you'll need to hold the "Ctrl" button (for Windows) or the "Command" button (for Mac) in the files browser.



After selecting 4 files successfully, it will display the chosen files name (*comma separated*) in the text field.



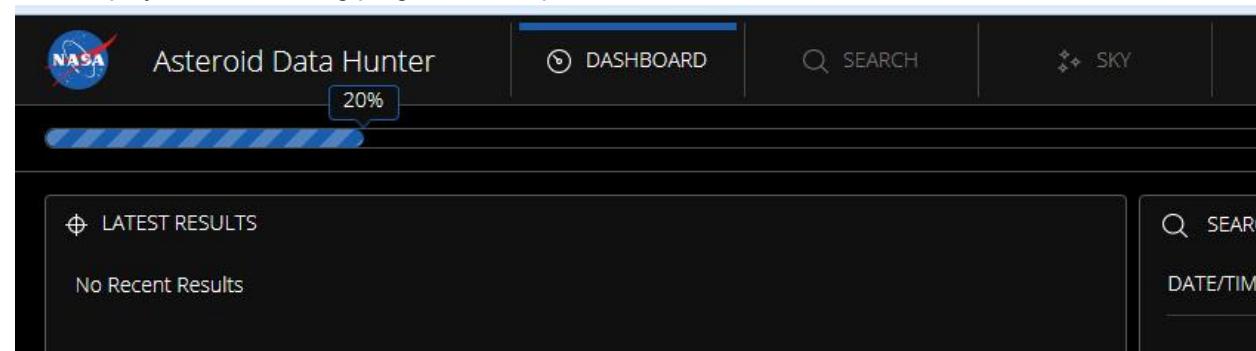
**NOTE: The app does not come pre-bundled with test data. To download test images / data, please use the “Test Images” link [here](#).**

## 4.2 Start Hunting Data

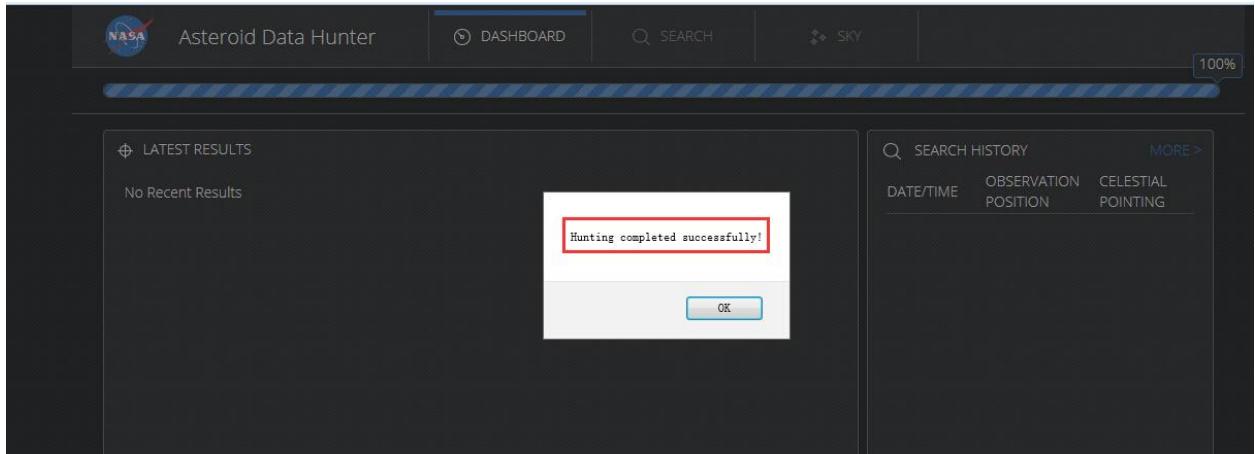
The user can click the "START HUNTING" button to start data hunting after selecting 4 data files.



It will display the data hunting progress with a percent indicator.



When the data hunt process is finished, it will display the results. It looks like:



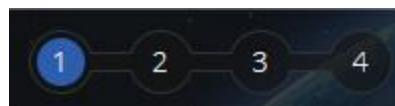
### 4.3 Display Data Hunt Results

Clicking "OK" will close the popup. It will then display the data hunt results. The latest results section and search history section will be updated with hunt data.

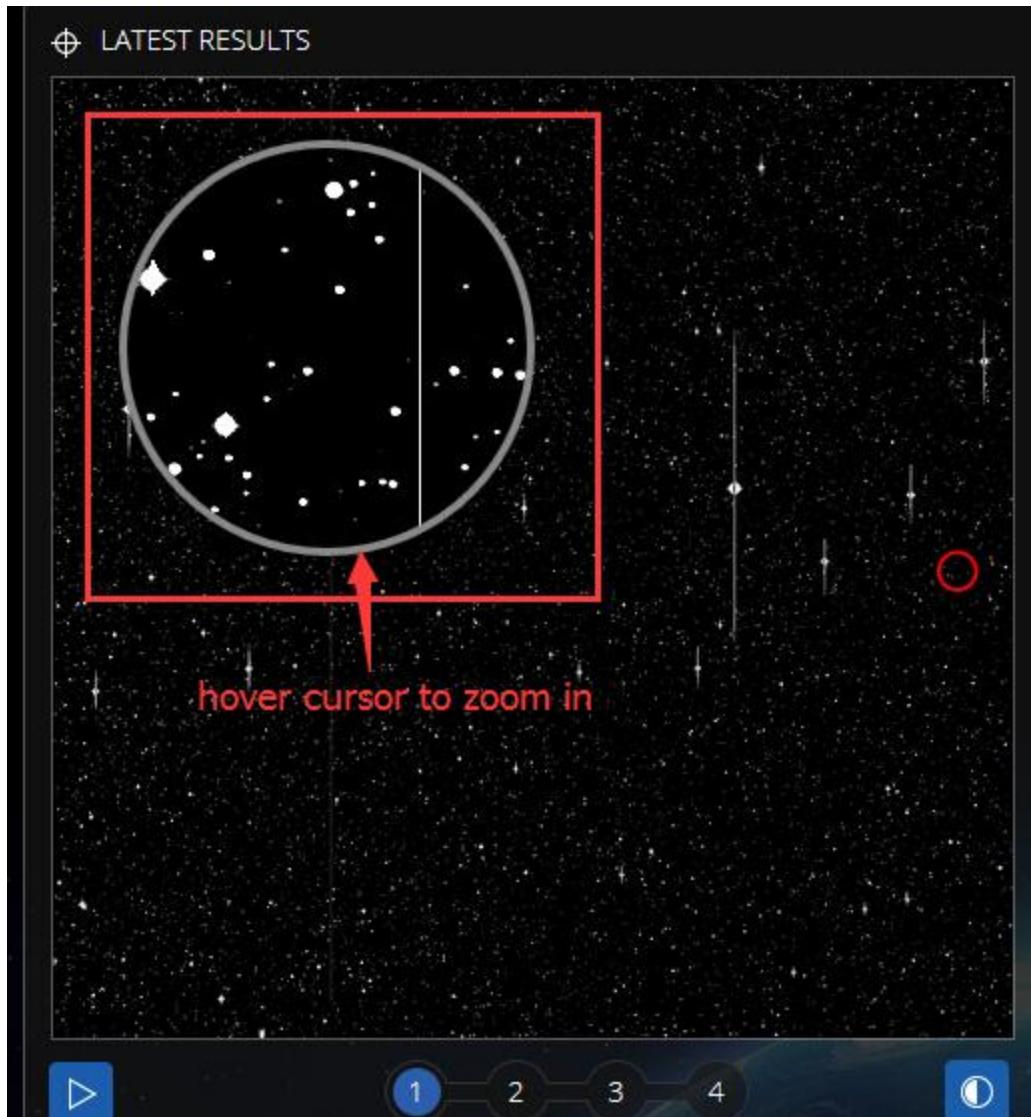
The screenshot shows the Asteroid Data Hunter interface after a successful hunt. The "LATEST RESULTS" section on the left displays a star map with several white dots representing detected asteroids. A red circle highlights one specific point on the map. Below the map are several search parameters: NEO? (No), RIGHT ASCENSION (253h1m2s), DECLINATION (+21°11'52"), ROUGH MAGNITUDE (0), SEARCH DATE / TIME (02/15/2015 10:02AM), OBSERVATION LATITUDE (0), OBSERVATION LONGITUDE (0), and SUBMITTED TO MPC? (No). The "SEARCH HISTORY" section on the right lists a series of observations with columns for DATE/TIME, OBSERVATION POSITION, and CELESTIAL POINTING. The first few entries are:

DATE/TIME	OBSERVATION POSITION	CELESTIAL POINTING
02/15/2015 10:02AM	253h1m2s	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	+21°11'52"	00°0'0"E
02/15/2015 10:02AM	253h55m36s	00°0'0"N
02/15/2015 10:02AM	+22°19'3"	00°0'0"E
02/15/2015 10:02AM	253h45m19s	00°0'0"N
02/15/2015 10:02AM	+21°33'19"	00°0'0"E
02/15/2015 10:02AM	255h0m32s	00°0'0"N
02/15/2015 10:02AM	+22°21'31"	00°0'0"E
02/15/2015 10:02AM	253h37m30s	00°0'0"N
02/15/2015 10:02AM	+22°24'59"	00°0'0"E
02/15/2015 10:02AM	255h52m41s	00°0'0"N
02/15/2015 10:02AM	+21°38'55"	00°0'0"E
02/15/2015 10:02AM	253h17m42s	00°0'0"N
02/15/2015 10:02AM	+21°45'34"	00°0'0"E
02/15/2015 10:02AM	253h49m39s	00°0'0"N
02/15/2015 10:02AM	+20°6'52"	00°0'0"E
02/15/2015 10:02AM	255h17m51s	00°0'0"N
02/15/2015 10:02AM	+21°9'52"	00°0'0"E
02/15/2015 10:02AM	252h55m18s	00°0'0"N
02/15/2015 10:02AM	+21°47'42"	00°0'0"E
02/15/2015	255h20m24s	00°0'0"N

The user can click any number button to view the image:



The user can hover the cursor on any point of the image to zoom in:



The user can click button to automatically play all 4 images in order. After that, the Play button will change to the Pause button which can pause the automatic playing:

The user can click button to invert the image.

The user can adjust the contrast using the slide bar:

There will be a "SEARCH HISTORY" section displayed with the hunt data. The user can click "MORE>" button to view more results. Each row in the table can be clicked to view its details. Please refer to chapter 4.2 for more details.

SEARCH HISTORY		<a href="#">MORE &gt;</a>
DATE/TIME	OBSERVATION POSITION	CELESTIAL POINTING
02/15/2015 10:02AM	255h47m10s +20°15'24"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	254h23m53s +22°26'48"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	253h37m30s +22°24'59"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	255h52m41s +21°38'55"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	253h45m19s +21°33'19"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	255h0m32s +22°21'31"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	253h17m42s +21°45'34"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	253h1m2s +21°11'52"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	255h20m24s +22°10'54"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	252h55m18s +21°47'42"	00°0'0"N 00°0'0"E
02/15/2015 10:02AM	253h49m39s +20°6'52"	00°0'0"N 00°0'0"E

## 5. View Search History

The user can view search history by selecting the "SEARCH" tab. By default, all data will be displayed and sorted by Date in descending order.

The screenshot shows the Asteroid Data Hunter dashboard with a search history table. The table has columns for DATE, TIME, RIGHT ASCENSION, DECLINATION, OBSERVATION LAT., OBSERVATION LNG., and SUBMITTED?. The data is sorted by DATE in descending order. A filter icon is at the top right of the table.

DATE	TIME	RIGHT ASCENSION	DECLINATION	OBSERVATION LAT.	OBSERVATION LNG.	SUBMITTED?
02/15/2015	10:02AM	252h58m34s	+19°59'29"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	253h51m30s	+20°16'26"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h10m30s	+20°17"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h47m2s	+20°23'25"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h14m36s	+22°35'17"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h14m2s	+22°34'41"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h13m50s	+22°32'26"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	254h59m58s	+20°11'16"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h28m1s	+20°8'48"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	254h47m39s	+20°27'31"	00°0'0"N	00°0'0"E	No
02/15/2015	10:02AM	255h50m44s	+22°21'37"	00°0'0"N	00°0'0"E	No

There is a pagination which can be used for navigating to different pages. The data can be sorted in ascending or descending order by each column header. The current sorting rule is indicated by the arrow direction next to the column header (Arrow down means descending, arrow up means ascending). There is also a filter which can filter by different filter criteria. Please refer to the chapter 4.1 for more details. The user can choose to view search details by clicking any row in the table. Please refer to the chapter 4.2 for more details.

## 5.1 Filter Search Data

By default, the filter section is not shown. Clicking the "Filter" icon will toggle the filter section:

The screenshot shows the Asteroid Data Hunter dashboard with the filter section expanded. It includes fields for DATE, TIME, and SUBMITTED, along with a FILTER button.

The data format of each option will follow the next table.

Data Element	Description	Format	Required?
Start Date	The start date of the search.	"MM/DD/YYYY"	N
End Date	The end date of the search.	"MM/DD/YYYY", "Start Date" must not be later than "End Date" if both are presented.	N
Start Time	The start time of the search.	"hh:mm" AM/PM.	N
End Time	The end time of the search.	"hh:mm" AM/PM, "Start Date/Time" must not be later than "End Date/Time" if both are	N

SUBMITTED	Whether the search is submitted or not.	presented. Possible values: Yes, No, All. Default value is "All".	Y
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The user can click the "Filter" button to filter the data.

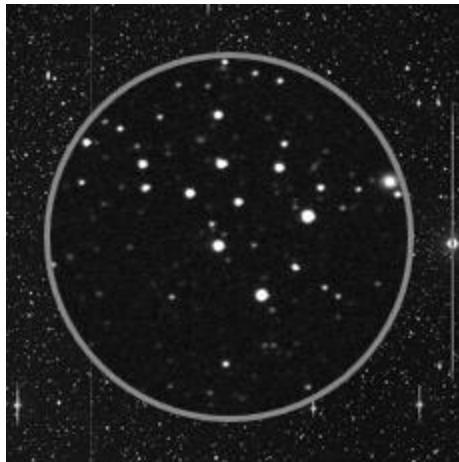
## 5.2 View Search Details

The search details look like:

The screenshot shows the Asteroid Data Hunter interface. At the top, there's a navigation bar with the NASA logo, the title "Asteroid Data Hunter", and links for "DASHBOARD", "SEARCH", and "SKY". Below the navigation is a section titled "SEARCH DETAILS" which includes a star map with a red circle highlighting a specific area. To the right of the map are several input fields and labels: "NEO?", "No"; "RIGHT ACSENSION", "25h47m10s"; "DECLINATION", "+20°15'24\"; "ROUGH MAGNITUDE", "0"; "SEARCH DATE / TIME", "02/15/2015 10:02AM"; "OBSERVATION LATITUDE", "0"; "OBSERVATION LONGITUDE", "0"; and "SUBMITTED TO MPC?", "No". On the far right, there's a "SUBMIT TO MPC" button with a warning message: "Are you really sure to submit this?". Below this are sections for "OBSERVATIONS" and "NEW COMET REPORTS", each containing placeholder text. At the bottom of the interface are navigation controls: a blue "next" button, a progress bar with steps 1 through 4, and a blue "previous" button.

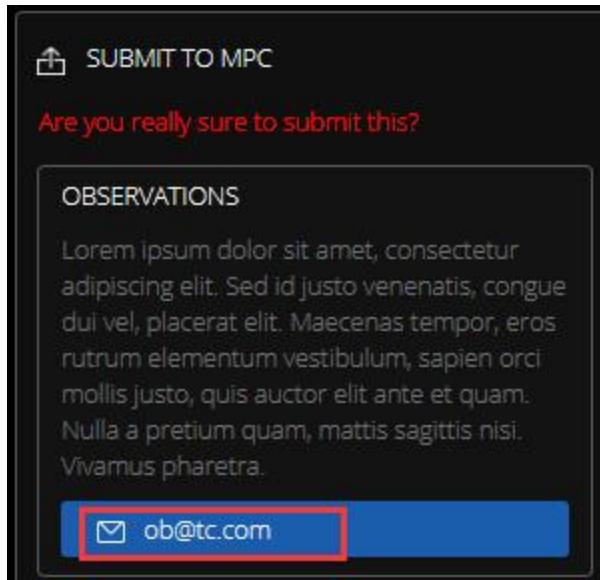
This screen looks similar to the dashboard except the right section, which can be used to submit to MPC and report new comet. Please refer to chapters 4.3 and 4.4 for more details.

The user can hover the cursor on any point of the image to zoom in:



### 5.3 Submit to MPC

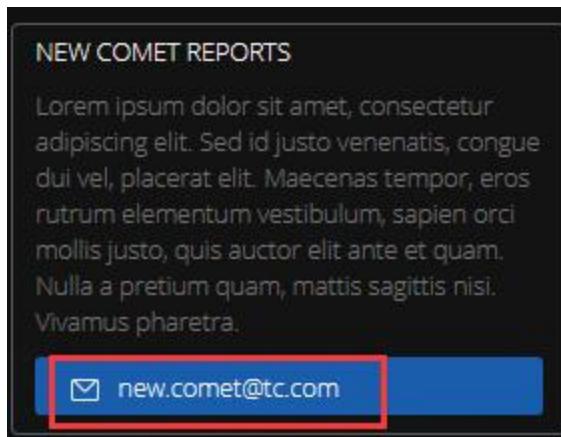
The user can click E-mail address in the "OBSERVATIONS" section to submit the observations to MPC.



It will compose an E-mail to this e-mail address.

### 5.4 Report New Comet

The user can click E-mail address in the "NEW COMET REPORTS" section to report new comet.



It will compose an E-mail to this e-mail address.

## 6. View Data on the SKY Page

The user can view data on the SKY page by selecting the "SKY" tab. By default, all data of the sky will be displayed and sorted by "OBJECT DESIGNATION" in ascending order.

NASA Asteroid Data Hunter | DASHBOARD | SEARCH | SKY

WHAT'S UP IN THE SKY

DATE:	02/15/2015	TIME:	11:51 AM	RA:	14 03 08	DEC:	+01 48.3	OBSERVATIONS:	
RADIUS:	200	ARC MINS	LIMITING MAGNITUDE (V):	20	OBSERVATORY CODE:	500	<input type="button" value="SEARCH"/>		
OBJECT DESIGNATION	RIGHT ASCENSION	DECLINATION	V	OFFSETS RA	OFFSETS DEC	MOTION RA	MOTION DEC	ORBIT	
(101849) 1999 JJ91	13h56m17.3s	+04°35'14"	19.3	102.6W	166.9N	13+	14+	12o	
(105094) 2000 LK1	13h54m24.9s	+03°20'05"	20	130.7W	91.8N	3+	9+	12o	
(10836) 1994 CS2	14h10m23.0s	+04°09'52"	17.5	108.7E	141.6N	16+	16+	16o	
(108912) 2001 PD12	13h59m11.9s	+01°55'54"	19.6	59.0W	7.6N	5+	9+	12o	
(112248) 2002 LG9	14h12m17.9s	+00°13'35"	19.9	137.4E	94.75	16+	5+	13o	
(114417) 2002 YX29	13h53m06.5s	+02°56'58"	19.8	150.3W	68.7N	8+	10+	12o	
(115751) 2003 UR202	13h52m29.6s	+00°42'15"	19.3	159.5W	66.05	8+	3+	14o	
(116017) 2003 WN84	14h02m25.6s	+01°32'50"	20	10.6W	15.55	7+	7+	13o	
(116524) 2004 BP46	14h08m17.1s	-01°08'46"	20	77.2E	177.1S	12+	10+	15o	

< 1 2 3 4 5 6 7 8 9 >

The data can be sorted in ascending or descending order by each column header. The current sorting rule is indicated by the arrow direction next to the column header (Arrow down means descending, arrow up means ascending). There is a pagination which can be used for navigating to different pages. There is also a filter section which can filter data by different filter criteria. Please refer to the chapter 5.1 for more details.

## 6.1 Filter Sky Data

There will be some filter options displayed in the "Filter" section:

DATE: 02/16/2015 TIME: 09:06 PM RA: 14 03 08 DEC: +01 48.3 OBSERVATIONS:

RADIUS: 200 ARC MINS LIMITING MAGNITUDE (V): 20 OBSERVATORY CODE: 500

The user can input the filter criteria and click the "SEARCH" button to filter data. The results will be updated based on entered filter criteria.