

# The Royal Astronomical Society Of Canada Thunder Bay Centre



## Astrophotographer's Certificate Level II Requirements'

The Thunder Bay Centre's Astrophotographer's Certificate Level II program is designed for the Advanced Astrophotographer as the next step in photographing the night sky.

The purpose of this program is to allow the Astrophotographer to display knowledge of the telescope and camera as well as the ability to use software to manipulate the pictures taken. This certificate will require a deeper understanding of the cameras, telescope, and software used and will expect a higher quality result. A greater depth of knowledge will be required in all areas. The participant is also expected to show more detail in recording and presenting observations.

It is required that the observer has completed both the Observer's Certificate Level I program and the Astrophotographer's Certificate Level I.

The list of requirements cannot cover all the situations that may occur during these observations and certain individuals may have access problems which would limit their ability to complete this certificate. Deviations from the listed requirements will require approval from the committee prior to submitting results for consideration.

Once this exercise has been completed you will be ready for the more advanced observing programs such as the Centre's Advanced Astrophotographer's Certificate Level III (Under Development).

Upon completion of the requirements, the Astrophotographer's Certificate Level II will be presented to the observer at the next general meeting and their achievement reported in the Newsletter.

Participants who may wish to present their project to the group will be given time at a meeting or space in the newsletter.

# Astrophotographer's Certificate Level II Requirements

## General

1. You are allowed to use the "Go-To" function of a computerized mount to find and track these objects, but are expected to report on the Telescope's alignment and accuracy. If you do use the "Go - To" function of your mount your submission will be acceptable for only the Astrophotographer's Certificate Level II and not for the Observer's Certificate Level II.
2. For the level II certificate the pictures are expected to be, where appropriate, multiple long exposure photos stacked together, and the final output is expected to be, in general, of a higher quality than level I.
3. Items listed with only a (C) or (T) must be photographed using the method specified.
4. When (T) telescope only is specified a camera with a telephoto lens may be used.
5. A digital recording of the pictures carefully referenced to the log entries and requirements list must be handed in with the required materials, or if the participant wishes a hard copy of the pictures and required information may be submitted.
6. Your observer's log or pertinent portions thereof must be submitted with the pictures.
7. If your log is submitted in digital format it should be in Rich Text Format (rtf). Pictures should be submitted as jpeg files.
8. All observations as recorded in your Observer's Log must include:
  1. Object name
  2. Time and date of observation (Specify EST, EDT as well as 12/24 hr. clock) and (Date DD/MM/YYYY)
  3. Telescope, camera, lens and software used
  4. Details of exposure settings including ISO, aperture, shutter speed, and

## General cont'

5. Details of telescope alignment and accuracy including, type of alignment, alignment stars, and accuracy or stated error if available.

## Constellations

1. Constellation pictures should be taken with a camera. The camera may be mounted on a telescope for tracking.
2. Constellation pictures must be clearly labelled and have lines added to show the shape of the constellation
3. The major stars must be named.
4. The name of the constellation must appear near the centre of the constellation.
5. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

## Prominent Stars

1. Prominent Star pictures may be taken with either a camera or through a telescope.
2. The name of the star must be clearly labelled and must have enough clearly labelled stars around it to identify the star in question.
3. Other major stars in the picture must be named.
4. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

## Solar System

1. Planet pictures must be taken through a telescope.
2. The name of the planet must be clearly labelled.
3. A clearly labelled nearby constellation or major stars must be shown, if available, or lacking that, enough information must be provided to clearly identify the object.
4. The name of any prominent stars in the pictures must be labelled.
5. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

## Basic Deep Sky

1. Basic Deep Sky pictures may be taken with either a camera or through a telescope.
2. In order to help identify the object the picture should include as wide a field as possible so as to include a nearby constellation or other easily identifiable objects.
3. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

## Landscape Pictures

1. Landscape pictures must be taken with camera.
2. Pictures may be taken at any time, night or day.
3. Weather or not a picture qualifies as "landscape" will be at the discretion of the observing committee.
4. These pictures are expected to show landscape and astronomical events such as moonrise over the Sleeping Giant or the Moon and Jupiter with landscape in the foreground.
5. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

## Other Astronomical Events

1. Other Astronomical Event pictures may be taken with either a camera or through a telescope.
2. The event or feature must be clearly labelled.
3. The name of any prominent stars in the pictures must be labelled.
4. The name of the photographer along with the date and time the picture was taken and the model of camera, lens, and or telescope used should appear at the bottom of the photograph.

# Astrophotographer's Certificate Level II

## Check List

### Constellations (C) (20 Required)

#### Spring

- Canes Venatici
- Leo Minor
- Coma Berenices
- Corvus
- Serpens (Caput)
- Corona Borealis

#### Summer

- Cepheus
- Ophiuchus
- Lacerta
- Hercules
- Delphinus
- Scutum

#### Autumn

- Cetus
- Aries
- Sagitta
- Pisces
- Aquarius
- Vulpecula

#### Winter

- Camelopardalis
- Cancer
- Lepus
- Triangulum
- Monoceros
- Lynx

### Major Stars (C) (T) (15 Required)

#### Spring

- Izar
- Porrima
- Alkaid
- Denebola

#### Summer

- Sheliak
- Alberio
- Tarazed
- Zubeneshamali

#### Autumn

- Algol
- Alpheratz
- Almach
- Thuban

#### Winter

- Alcyone
- Bellatrix
- Saiph
- Elnath
- Mintaka
- Mirzam
- Kochab
- Menkalinan

### Multiple Star Systems (T) (10 Required)

#### Spring

- (Zeta) Ursae Majoris
- (Alpha) Canum Venaticorum
- (Gamma) Leonis
- (Mu) Bootis
- (Xi) Bootis
- (Gamma) Virginis
- (Iota) Cancri
- (Alpha) Ursae Minoris

#### Summer

- (Alpha) Librae
- (Beta) Scorpii
- (Beta) Cygni
- (Epsilon) Lyrae
- (Alpha) Herculis
- (Rho) Herculis
- (Omicron) Cygni
- (Rho) Ophuchi
- 61 Cygni
- (Gamma) Delphini

## Multiple Star Systems Cont'

### Autumn

- ☐ (Alpha) Capricorni
- ☐ (Nu) Draconis
- ☐ (Beta) Capricorni
- ☐ (Gamma) Andromedae
- ☐ (Gamma) Arietis
- ☐ (Eta) Cassiopeiae

### Winter

- ☐ (Alpha) Geminorum
- ☐ (Sigma) Orionis
- ☐ (Gamma) Arietis
- ☐ (Beta) Monocerotis
- ☐ (Gamma) Leporis
- ☐ (Delta) Orionis

## Solar System (T) (5 Required)

- |           |           |
|-----------|-----------|
| ☐ Mercury | ☐ Saturn  |
| ☐ Venus   | ☐ Uranus  |
| ☐ Mars    | ☐ Neptune |
| ☐ Jupiter | ☐ Vesta   |

## Deep Sky (T) (10 Required) (3 Nebula)(3 Galaxies)(4 clusters)

### Spring

- ☐ M-44 Cancer
- ☐ M-3 Canes Venatici
- ☐ M-81/82 Ursa Major
- ☐ M-27 Vulpecula (Dumbell)
- ☐ M51
- ☐ M101

### Summer

- ☐ M-13 Hercules
- ☐ Collendar 399 (Coathanger)
- ☐ M-11 Scutum (Wild Duck)
- ☐ M-57 Lyra (Ring)
- ☐ M20
- ☐ M8

### Autumn

- ☐ M-103 Cassiopeia
- ☐ NGC 869/884 Perseus
- ☐ NGC 7293 Aquarius(Helix)
- ☐ M1
- ☐ M42

### Winter

- ☐ M-41 Canis Major
- ☐ M-34 Perseus
- ☐ M-36 Auriga
- ☐ M-47 Puppis
- ☐ Barnards Loop

## Landscape Pictures (C) (T) (5 Required)

☐ See requirements document for description

## Other Astronomical Events (C) (T) (7 Required)

- ☐ Eclipse of the Moon (Total/Partial/Penumbral)
- ☐ Earth Shine
- ☐ Occultation (Lunar)
- ☐ Planetary/lunar Grouping (3 bodies)
- ☐ Aurora Borealis
- ☐ Meteor Shower
- ☐ Orbiting artificial satellites (at least 3)
- ☐ International Space Station
- ☐ Iridium Flare
- ☐ Comet
- ☐ Zodiacal Light
- ☐ Lunar Halo
- ☐ Daytime Moon
- ☐ Milky Way
- ☐ Noctalucent Clouds
- ☐ Crepuscular rays,