

Selected Publications

Dr. Townes work was published widely in books and peer-reviewed journal articles, including:

Gordon, J.; Zeiger, H.; Townes, Charles (1955). "The Maser—New Type of Microwave Amplifier, Frequency Standard, and Spectrometer".

Shimoda, K.; Wang, T.; Townes, Charles (1956). "Further Aspects of the Theory of the Maser".

Schawlow, Arthur; Townes, Charles (1958). "Infrared and Optical Masers".

Townes, Charles (1999). *How the Laser Happened: Adventures Of a Scientist*.

Townes, Charles; Schawlow, Arthur (1955). *Microwave Spectroscopy*.

Townes, Charles (1995). *Making Waves*.



For more information about the

BSA Nova and

Supernova Awards for all Scouts, please

visit:

www.scouting.org/stem/awards



DR. CHARLES H. TOWNES

SUPERNOVA AWARD

FOR

WEBELOS SCOUTS



BOY SCOUTS OF AMERICA®
MICHIGAN CROSSROADS COUNCIL



Dr. Charles H. Townes Supernova Award for Webelos Scouts

Requirements

1. Complete the following Webelos adventures: Adventures in Science, Engineer, and Scouting Adventure.
2. Complete three of the following adventures: Build It, Building a Better World, Castaway, First Responder, Into the Wild, and Into the Woods.
3. Find interesting facts about Dr. Charles H. Townes using resources in your school or local library or on the Internet (with your parent's or guardian's permission and guidance). Then discuss what you learned with your mentor, including answers to the following questions: What very important award did Dr. Townes earn? What was Dr. Townes' most famous invention?
4. Find out about five other famous scientists, technology innovators, engineers, or mathematicians approved by your mentor. Discuss what you learned with your mentor.
5. Speak with your teacher(s) at school (or your parents if you are home-schooled) OR one of your Cub Scout leaders about your interest in earning the Webelos Scout Supernova award. Ask them why they think math and science are important in your education. Discuss what you learn with your mentor.
6. Participate in a science project or experiment in your classroom or school. Discuss this activity with your mentor.
7. Do ONE of the following:
 - Visit with someone who works in a STEM-related career. Discuss what you learned with your mentor.
 - Learn about a career that depends on knowledge about science, technology, engineering, or mathematics. Discuss what you learned with your mentor.
8. Under the direct supervision of your mentor, do an experiment that shows how the scientific method (or scientific process) is used. Pre-prepare a short report on the results of your experiment for your mentor.
9. Participate in a Nova- or other STEM-related activity in your Webelos Scout den or pack meeting that is conducted by a Boy Scout or Venturer who is working on his or her Supernova award. If this is not possible, participate in another Nova- or STEM-related activity in your den or pack meeting.

Upon completion by your Scout, submit an application for the Webelos Scout Supernova award, which can be downloaded from the Council website here:

www.michiganscouting.org/stem

Submit the completed application for review and approval to:

Michigan Crossroads Council, BSA 137 S. Marketplace Blvd. Lansing, MI 48917

ATTN: Kimberlee Manor, STEM Program Director

Questions? Email: kimberlee.manor@scouting.org.