

Upcoming Events

March 2003

- **Saturday, March 1**
(Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory.
- **Saturday, March 8**
(Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory.
- **Friday, March 21** (Starting at 7:30pm) University Lowbrow Astronomers' Club Meeting held in either room 130 or 807 in the Dennison Bldg. Topic: "Dark Energy and what it can do for you" - Joe Bernstein
- **Saturday, April 5** Saturday Morning Physics. Katy Freese on "Dark Matter and Dark Energy in Cosmology"
- **Friday, April 18** (Starting at 7:30) University Lowbrow Astronomers' Club Meeting held in either room 130 or 807 in the Dennison Building. Elections and Swap Meet.



REFLECTIONS REFRACTIONS

of the University Lowbrow Astronomers



March 2003



BYLAWS ISSUE

Voting on the Bylaws

Kathy Hillig,
representing the Bylaws Committee

Amending and updating an organization's bylaws is an infrequent but occasionally necessary task as an organization grows and changes. Bylaws show what is important to the membership - in our case things like meetings, open houses, taking care of the McMath telescope and observatory, and enjoyment of astronomy. Bylaws need not define every detail of an organization, just the most important ones, and should provide a mechanism to make additional amendments as needed.

The Bylaws Committee has worked hard over the last 6 months to revise and update our Bylaws; the proposed changes were presented at the December 2002 meeting. All questions and comments have been discussed in depth, and we believe the resulting version is ready for a vote. Because of the broad scope of the changes, the entire proposed Bylaws are presented, rather than an item-by-item list of amendments. All members unable to attend the meeting may vote by sending their ballot to the Treasurer before the date of the vote: April 18, 2003 (note that this is Good Friday). •

Bylaws of the University Lowbrow Astronomers

Version 2 Revised 3/3/03

Article I: Name

The name of this organization is “*University Lowbrow Astronomers*” hereinafter referred to as *the Lowbrows* or *the Club*.

Article II: Object

The objects of the Lowbrows are to

- Maintain and operate the University of Michigan’s 24” McMath telescope and other telescopes and equipment owned by the Lowbrows,
- Care for the Peach Mountain optical observatory facility for the use of the members and the public,
- Learn about astronomy from each other and guest speakers,
- Share our knowledge of astronomy with the public through open houses and other programs,
- Promote the enjoyment and appreciation of astronomy by club members and the public, and
- Have fun while accomplishing all of the above.

Article III: Members

A. All those who have paid their dues within the preceding 12 months will be considered members. Members are encouraged to attend meetings and other events, and to actively participate in all activities of the Club.

B. Membership dues shall be at one price for individual or family membership and at a lower price for students and seniors (age 55+).

C. Members are entitled to receive the monthly Reflections newsletter and to be placed on the mailing lists (newsletter, e-mail, etc).

D. Members may use the 24” McMath telescope after receiving training and being certified by the Observatory Director. Untrained members may use their own telescopes on Peach Mountain once they understand the rules for entering and using Peach Mountain.

E. Honorary membership may be extended to deserving individuals by consensus of the officers; honorary members may not vote or hold office, except if they pay dues and become regular members.

F. The term of membership expires one year from the first of the following month after dues are paid.

G. As long as the Club continues to exist, dues will not be refunded.

H. Only dues-paying members will be eligible to vote or run for office.

I. Family membership includes only those in the im-

mediate family. Only family members age 14 and over are eligible to vote.

J. Members may be expelled from the Club for reasons such as:

- a. Willful misuse and/or damage to Club and/or University property
- b. Illegal activities on University property or at Club activities
- c. Other conduct deemed inappropriate behavior by the officers

1. A motion to remove the member must be brought before the membership, if a majority of the officers approve the motion.

2. Removal will be effective upon approval by two-thirds of the members voting.

Article IV: Officers

A. The elected offices shall be:

- President
- Vice President(s)
- Treasurer
- Newsletter Editor
- Observatory Director
- Webmaster (optional)

1. Eligibility for office

a. The President must have previously held another Lowbrow office.

b. There shall be at least one and no more than four Vice Presidents to share the duties.

c. The Observatory Director must have served on the Observatory Committee for at least one year.

d. The Webmaster must have the appropriate ability. If no member has appropriate abilities, this office may be left vacant and the Treasurer must appoint someone to maintain the Club e-mail list.

e. A member may hold up to two offices simultaneously, except that the President may not also be Treasurer or Vice President.

B. Duties of Officers

1. The President is responsible for:

- a. Establishing Club direction with the advice and consent of the elected officers and general membership.
- b. Presiding over Club and officers’ meetings.
- c. Coordinating and overseeing the activities of the Club in accordance with its objectives.
- d. Acting as a Club representative to The University of Michigan, other organizations and public events.
- e. Approving official Lowbrow correspondence.
- f. Ensuring the Annual Report is prepared during the first quarter of each year.
- g. Being the alternate signer on the bank account or

appointing a vice president as alternate signer.

2. Vice President(s) is (are) responsible for:

a. Organizing monthly programs and keeping other officers informed of monthly programs and changes.

b. Assisting the President with governance of the Organization and presiding over meetings in the President's absence.

c. Keeping a record of the meetings, to be published in the following month's newsletter. This need not be word-for-word but rather an outline of what the program was, proposals, motions, voting results, announcements, etc.

d. Chairing the Communications Committee. (One Vice President is assigned this task.)

e. Notifying the membership, through e-mail or other means, of upcoming meetings and events.

3. The Treasurer is responsible for:

a. Keeping a record (including receipts) of all income and expenditures of the Club.

b. Monitoring the use of Club funds and reporting any misuse.

c. Preparing a financial report to the Lowbrows twice a year to be presented with the Annual Report in spring and at a fall meeting.

d. Keeping a record of who has paid dues.

e. Keeping the membership address list up-to-date. All changes of address and phone number should be reported to the Treasurer.

f. Paying for expenditures

1) Expenditures shall be considered as one of two types:

a) General Operating Expenditures

b) Special Expenditures

2) General expenditures are the ongoing expenses incurred in the fulfillment of the duties of officers and the basic objectives of the Club. Receipts must be submitted within 90 days of the expense for reimbursement. These do not require a vote by the membership to pay. Examples:

a) Minor repair and upkeep expenses of the telescope and observatory.

b) Cost of printing the newsletter, producing and mailing meeting and event announcements, and printing and disseminating posters and flyers.

c) Long-distance telephone charges by members on Lowbrow business and amounting to a maximum of \$20 in one month.

3) Special expenditures are one-time expenses for a special purpose or of a large sum (over \$100). These do require a vote by the membership to pay. Examples:

a) Major expenses towards the repair and upkeep of the McMath telescope and observatory.

b) Purchases of equipment for the telescope or observatory,

c) Expenses of special events and activities planned by the Club.

4. The Newsletter Editor is responsible for:

a. The appearance and technical details of the newsletter with input on contents from the officers and members.

1) The contents of the newsletter should be:

a) Visually appealing

b) Grammatically correct

c) Scientifically and factually accurate

d) Interesting

2) The contents of the newsletter should not be

a) Defamatory

b) Plagiaristic

c) Offensive to members of any race, creed or gender

d) Obscene

e) Inane

b. Printing the newsletter in an economical way consistent with the above specifications.

c. Publishing the Annual Report in the Newsletter in the first quarter of each year.

5. The Observatory Director is responsible for:

a. Chairing the Observatory Committee.

b. Reporting all progress and necessary expenditures on the telescope to the membership.

c. Keeping track of the Lowbrow's gate keys to Peach Mountain and maintaining a log of holders.

d. Maintaining and changing the combination on the observatory lock.

e. Keeping the public and membership informed on the status of the open houses via voice mail and the internet web pages.

f. Supervising the responsible use of Peach Mountain for observing by the membership.

6. The Webmaster is responsible for:

a. Maintaining the contents of the Lowbrow website with input from the officers and members.

1) The appearance of the website should be:

a) Visually appealing

b) Grammatically correct

c) Scientifically and factually accurate

d) Interesting

e) Up to date

2) The contents of the newsletter should not be

a) Defamatory

b) Plagiaristic

c) Offensive to members of any race, creed or gender

d) Obscene

e) Inane

b. Maintaining the club e-mail list or designating a subcommittee to do so.

c. The website shall include an e-mail address or some other mechanism for website visitors to contact the Club. The webmaster is responsible for answering this e-mail or designating a subcommittee to do so.

C. General Duties of Officers

1. Officers shall prepare an Annual Report to be published in the Newsletter in the first quarter of each year (before the April elections).

2. If an officer is unable to perform a specific duty at a specific time, that officer may call upon another officer or member to perform that duty.

a) The substitute officer must follow the responsibilities for the original officer as outlined above.

b) The other officers must be informed of the change in responsibilities.

D. Interim Officers

1. All officers who will not be able to perform their duties for more than three consecutive months must inform the Club so that an interim officer may be elected.

2. An interim officer's term will end when the regular officer resumes his/her duties or on the date of the next regular elections, whichever comes first.

E. Resignations and other Vacancies

1. If an officer is no longer able to perform his/her duties, the office will be considered vacant.

2. The positions of officers who quit the Club, or resign the office are considered vacant. Resignation must be in writing and submitted to the President or Treasurer and will be assumed to be effective immediately upon receipt.

3. All vacancies will be filled as soon as possible by a special election which will proceed as a regular election would.

F. Removal of Officers

1. Officers may be removed from office for any of the following reasons:

a. Misuse of Club funds

b. Willful misuse and/or damage to Club and/or university property

c. Assault of a member or nonmember during a Club meeting or outing.

d. Failure to perform the duties of the office in an appropriate and/or intelligent manner.

e. Failure to pay dues.

2. A motion to remove the officer must be brought before the membership, if a majority of the remaining officers approve the motion.

3. Removal will be effective upon approval by two-thirds of the members voting and the position will be con-

sidered vacant.

Article V: Elections & Voting

A. Elections

1. Officers will be elected at the April meeting. Terms are to begin immediately after the meeting and end after the next annual elections.

2. Nominations will be taken by the President starting at the March meeting. Names of nominees will be published in the April Newsletter prior to the April meeting. Nominations may continue at the April meeting.

3. Voting will proceed by paper ballot if more than the necessary number of candidates run for any office or by a show of hands if there are no uncontested offices at the April meeting. Only members present at the meeting may vote.

4. The count will be tallied by two members not running for office.

5. The nominee for an office obtaining a plurality of the vote will win that office.

B. Voting

1. Voting for officers will be by paper ballot, or a show of hands if there are no uncontested offices, of those members present at the meeting.

2. Voting for the removal of an officer will be by paper ballot. Ballots will be mailed to current members with known addresses and members will have at least 15 days to return the ballot to a designated officer.

3. Voting for the removal of a member will be by paper ballot of those members present at the meeting.

4. Voting for amendments to the Bylaws will be by show of hands plus any absentee ballots received by the date of the vote.

5. Voting for all other motions will be by a show of hands. A simple majority of those voting is required for a motion to pass.

Article VI: Meetings

A. Club Meetings

1. Regular meetings shall be held monthly at a day, time and place as convenient as possible to the membership, and shall be announced in the newsletter to all members.

2. The Lowbrows may plan other events and activities from time to time, to be held at the day, time and place decided upon by the membership.

B. Officers' meetings

1. Officers shall meet, face to face, on at least a quarterly basis to

a. Plan Club functions and participation in other events.

b. Prioritize and set goals for each year.

c. Determine when major projects are needed on the McMath telescope or the Peach Mountain observatory

and grounds.

d. Organize support as needed to assist the officers in completing their duties and to carry out the Club activities and projects.

e. Advise and consent on interaction with the public and university.

f. Annually internally audit the treasurer's books.

g. Annually publish the standing rules of the Club.

2. Officers may also make decisions by e-mail provided all officers respond.

Article VII: Committees

A. Committees consists of chairs as designated by these Bylaws and volunteer members. If more members than required volunteer to serve, the officers will decide who will serve from those volunteering.

B. Standing committees are

1. Observatory Committee, chaired by the Observatory Director, consisting of at least 3 members, inclusive of the chair. Responsibilities are:

a. Supervising the renovation, repair and upkeep of the 24-inch telescope and observatory.

b. Scheduling of observation time with the 24-inch telescope should an increase in demand cause conflicts to arise.

c. Publicity and organization of public open houses and events held at Peach Mountain.

d. Interfacing with the University on issues relating to the observatory and grounds, the McMath telescope, open houses and special events held at Peach Mountain.

e. Training of members on the operation and care of the 24" McMath telescope.

f. Keeping an inventory of all equipment and property belonging to the Lowbrows.

2. Communications/Public Relations Committee, chaired by one of the Vice Presidents, consisting of at least 3 members, inclusive of the chair. Responsibilities are:

a. Greeting new attendees at monthly meetings.

b. Welcoming guests at star parties and providing Lowbrow information (e.g., club membership information, star party etiquette, etc.).

c. Organizing annual elections.

C. Ad hoc committees may be formed and disbanded as needed. Any member of the Club may chair them.

Article VIII: Parliamentary Authority

A. Meetings shall be conducted according to the most recent edition of *Robert's Rules of Order* as interpreted by the presiding officer, and in which they are not inconsistent with the Bylaws or special rules of the Club.

Article IX: Amendment of Bylaws

A. These bylaws may be amended after the following conditions have been met:

1. All members have been notified, in writing through the Newsletter and by e-mail, at least one month before voting is to take place, of the exact wording of the proposed amendment.

2. All members unable to attend the meeting when the vote is scheduled to take place may send an absentee ballot to the Treasurer. The ballot must be received by the Treasurer before the date of the vote.

3. All members present at the meeting may vote.

4. A simple majority of those voting, including absentee ballots, is sufficient to approve the amendment.

Article X: Dissolution of the Club

A. Dissolution of the Club can only occur upon vote of the membership using the conditions for amending the bylaws, except that approval by two-thirds of those voting are needed to pass.

B. Once the motion for dissolution is approved, the Club will work with the University to remove the Club's property from Peach Mountain, ensure the McMath telescope is in working order, and return the keys to the University.

C. Non-monetary assets and equipment of the Club will be disposed of using these methods in the following order:

1. Auction to members, with minimum bids set by the officers.

2. Offer of sale of remaining assets to the public with prices set by the officers or by auction.

3. Donation of assets to schools, other astronomy clubs, or other non-profit organizations.

D. All monetary assets, including proceeds from the disposition of the Club's assets and equipment as mentioned above, shall be distributed in equal shares to those members who are on the rolls on the date of the dissolution vote. ●

Telescope Topics

“A Spectroscope You Can Build”

by
Tom Ryan

One of the things that makes astronomy so fascinating is the way it connects to so many other interesting areas. Information about the universe reaches us primarily as light, and spectroscopy is one of the ways of extracting information from the light's sources and the space between them and us. Spectroscopy, of course, also helps chemists unravel the structure and interactions of chemical elements, and provided physicists with a new element (Helium, first seen in the spectrum of the star Helios), and clues as to the inner workings of stars and nebulae. Additionally, from an artist's standpoint, spectra are just fun to look at.

You can build a spectroscope out of simple materials. If you have a camera, you can turn your spectroscope into a spectrograph, and explore and record the spectra of many different light sources. (Did you know that many traffic signals use mercury vapor lamps as light sources? Since mercury vapor lights are slow to turn on, what does that say about the lights changing from red to green?) Very little is required in the way of materials to make a simple spectroscope.

My first spectroscope was made from a small prism, a couple of small refractor lenses (the department store variety), some books, and an eyepiece. I recommend this variety as a first effort, because it is simple to put together, inexpensive, and fairly powerful. I set my first spectroscope up on the dining room table, after it was dark outside, so I could look at the streetlights and car headlights. The prism is set up on end, and works best with reasonably parallel light, but the light sources outside the house are close enough to infinity for this arrangement to work. After the prism, I set one of the refractor lenses, and then searched the focal area of the refractor lens with a piece of waxed paper until I saw spectra. I then switched the waxed paper for an eyepiece. (A finder scope would work in place of the refractor lens and eyepiece, but every time I get a telescope in my hands, I take it apart, so I had only the pieces handy.) The thing to keep in mind, here, is that parallel light from a streetlight will enter the window, pass into the prism, bend about 45 to 60 degrees, depending on your prism, squarely enter the refractor lens, and will be focused at some point in space behind the lens, where it can be examined with an eyepiece.

When I did this, I was pleased to see that I could actually see spectra, but the details were smeared out. In

this optical arrangement, the lens forms images of the light source, and since the light source was resolvable, what I saw was multiple images of the light bulb, displaced sideways according to its spectra. Each image overlapped itself at a slightly different frequency.

I therefore added a vertical slit, in the form of a pair of books, placed close together and on edge, between the window and the prism. Since things were getting hard to align, I substituted a fluorescent light for the headlights by propping up a light fixture on the other side of the slit. Then I collimated the light from the slit by placing a second refractor lens between the slit and the prism, with the slit at the lens' focus. Lo and behold, I could see the mercury emission lines (and the continuous spectrum from the phosphors which coat the tube) when I looked through the eyepiece. I could even sharpen the lines by pushing the books closer together, which narrowed the slit. (The lines I saw were now images of the slit, instead of the source.)

My next spectroscope was more versatile and portable. For the focusing lens and eyepiece, I substituted a camera. For the prism, I substituted a transmission diffraction grating. I mounted the grating in a frame to hold it flat, and connected the grating frame and camera together with a metal bar. Basically, the camera looked through the frame which held the diffraction grating. The grating I used bent the light through 90 degrees, so the camera saw normal views straight through the grating, and diffracted views at 90 degrees to the direction the camera was pointing. Since I was only interested in the diffracted views, I placed a black cloth beyond the grating to block the normal view. The pictures of the State Theater sign were taken with this arrangement.

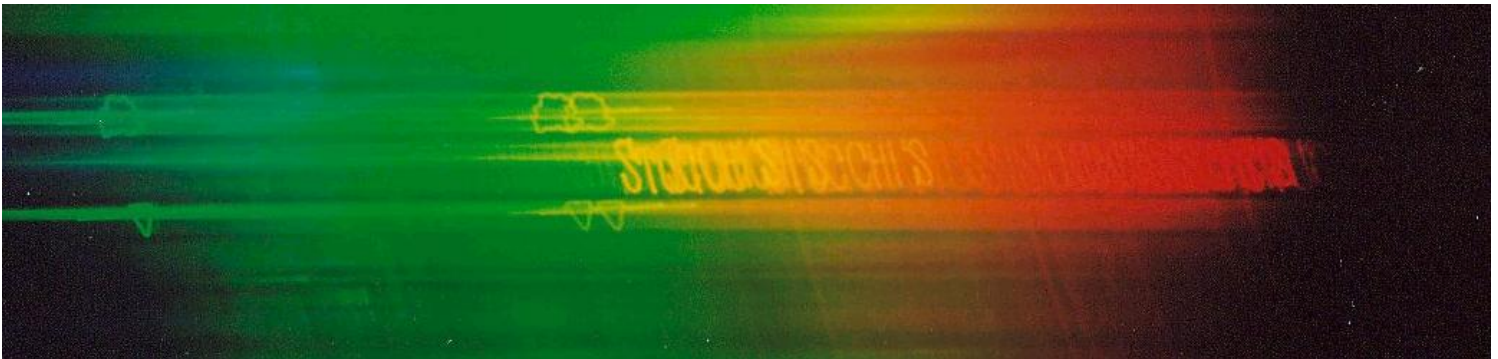
A grating that bends the light through 90 degrees makes it easy to block unwanted light, and it also separates the diffracted orders very well. However, it has a tremendous amount of dispersion, and I can't get a complete spectrum onto a single piece of film.

A better choice of gratings would be Stock No. L54-509 from Edmund Industrial Optics (the old Edmund Scientific Co.). This grating bends the light through only 19 degrees, but it has good order separation and adequate dispersion for comparing spectra. It should be sandwiched between two pieces of thin glass to keep it flat. (You can epoxy the glass plates together around their edges, or you can epoxy the grating film directly to one piece of glass, for reduced reflections. Make sure you put the glue on the unruled side of the diffraction grating film.) The only problem with using a grating with a 19 degree angle is blocking the direct light from a source that is only 19 degrees away from the images of your spectra. A telephoto lens might help here, along with some ingenious baffling. If you want to experiment with a more easily baffled setup, Edmund also sells a 36 degree grating,

Stock No. L40-267.

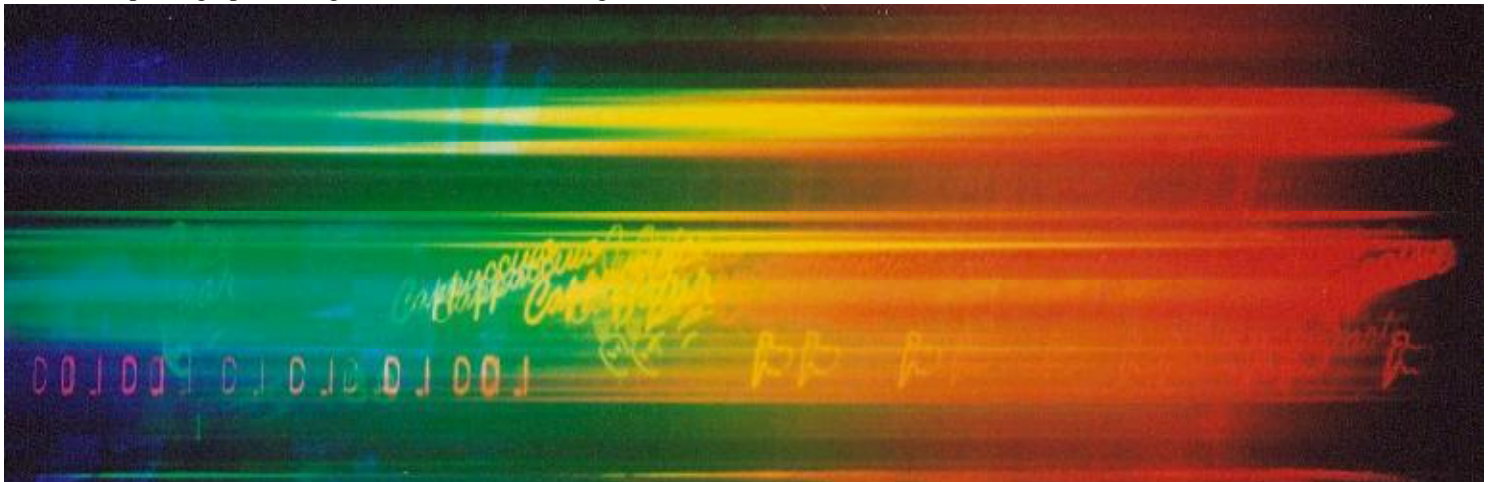
With the addition of a second camera lens (or an eyepiece), this setup can be used to take spectra of astronomical objects. The second camera lens, or eyepiece, is used to take the light from the focal plane of the telescope and make it parallel before entering the diffraction grating. By using fast film, you should be able to record spectra of bright objects fairly quickly. I admit that I have not tried this yet. The spectroscope was finished in November, and we've been under Michigan skies since then. Nevertheless, when the clouds part, I'll be hunting the wild spectra. ●

This is the original sign.
The spectrograph of this is
directly below.



Spectrograph of Stucchi's front window sign on State Street.

This is a spectrograph of a sign in a café window along the West side of State Street.



ABSENTEE BALLOT

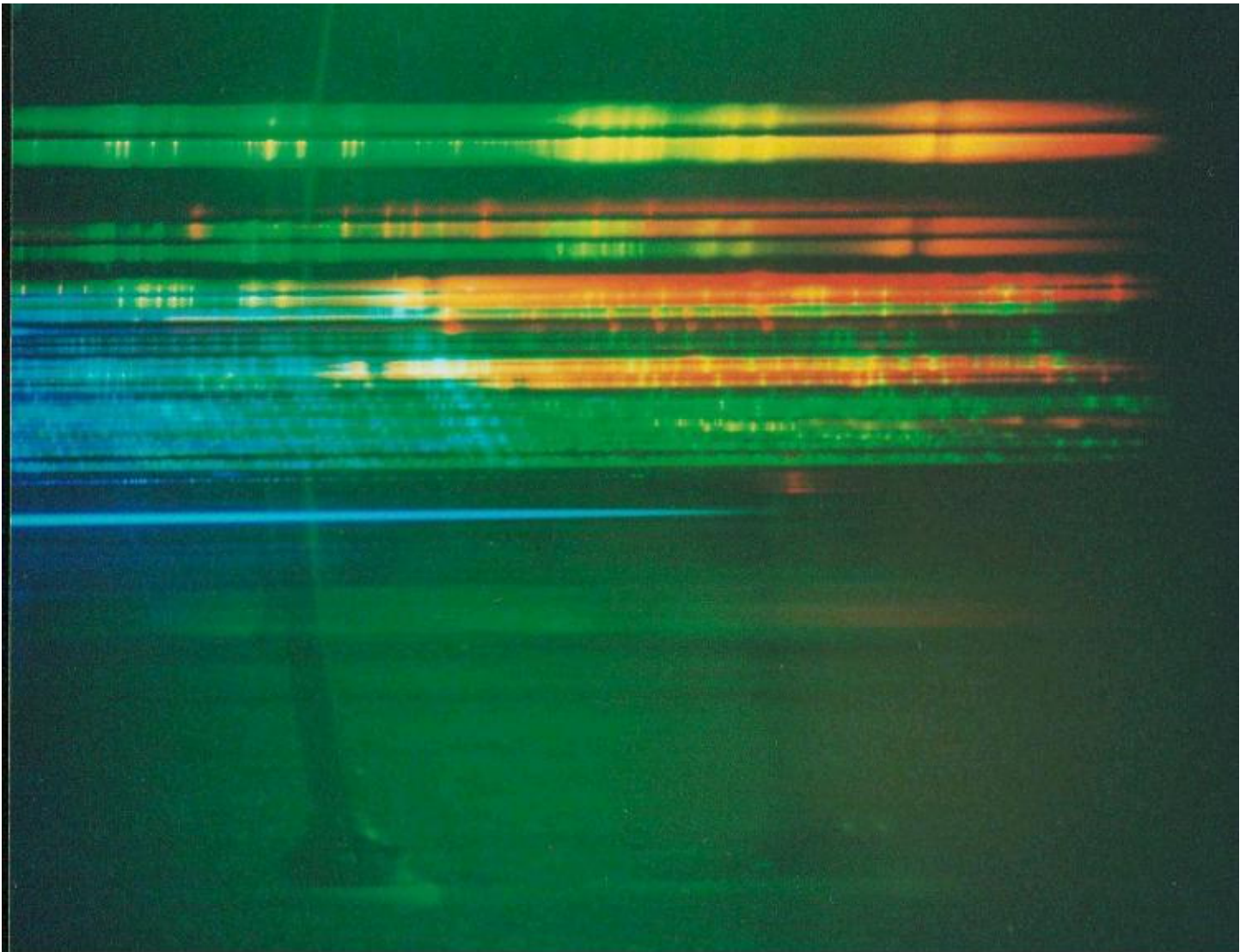
This ballot must be received by Charlie Nielsen by April 18, 2003. Please mail it to:

Charlie Nielsen
6655 Jackson Road #415
Ann Arbor, MI 48103

I vote For Against (check one) adopting Revision 2 of the Bylaws of the University Lowbrow Astronomers.

Print Name: _____

Signature: _____



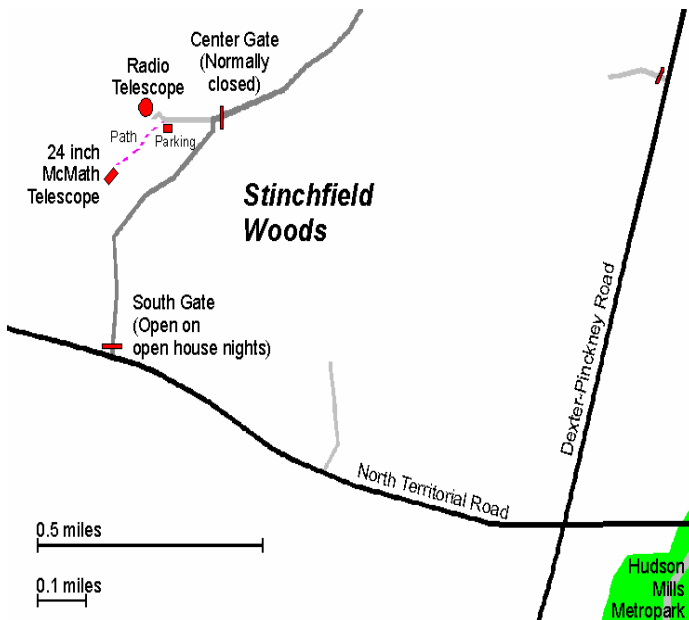
A view looking South along State Street. Note the lampposts.

About the University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of Astronomy enthusiasts which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 130 or 807). Meetings begin at 7:30 PM and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinckney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party may be canceled if it's cloudy or very cold at sunset. For further information call (734) 480-4514.

Places and Times

Dennison Hall, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of South University Avenue. The meeting is held in room 130. Monthly meetings of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.



Peach Mountain Observatory is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMath 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of Dexter-Pinckney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.

Public Star Parties

Public Open House/Star Parties are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitoes - bring insect repellent, and it does get cold at night so dress warmly!

Amateur Telescope Making Group meets monthly, with the location rotating among member's houses. See the calendar on the front cover page for the time and location of next meeting.

Membership

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, and \$12 per year for students and seniors (age 55/+). This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training).

Dues can be paid to the club treasurer Charlie Nielsen at the monthly meeting or by mail at this address:

6655 Jackson Road #415
Ann Arbor, MI 48103

Magazines

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:

Sky and Telescope: \$29.95 / year

Astronomy: \$29.00 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer. Make the check payable to "University Lowbrow Astronomers".

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or Email to Newsletter Editors at:

John Ryan (734) 662-4188 john_edward_ryan@hotmail.com
to discuss length and format. Announcements and articles are due by the first Friday of each month.

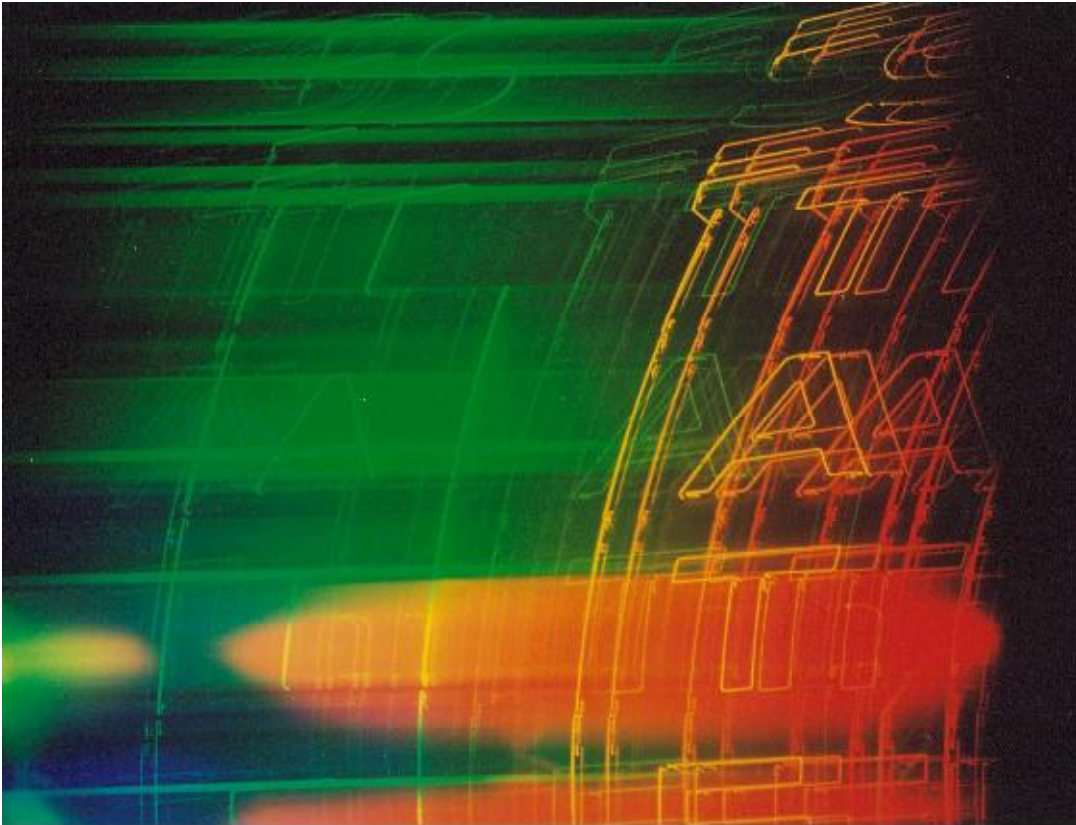
Telephone Numbers

| | |
|-----------------------|--------------------------------|
| President: | D. C. Moons |
| Vice Presidents: | John Causland (734) 747-8437 |
| | Dave Snyder (734) 747-6537 |
| | Doug Warshaw (734) 998-1158 |
| Treasurer: | Charlie Nielson (734) 747-6585 |
| Observatory Director: | Bernard Friberg (734) 761-1875 |
| Newsletter Editor: | John Ryan (734) 662-4188 |
| Keyholders: | Chris Sarnecki (734) 426-5772 |
| | Fred Schebor (734) 426-2363 |

Lowbrow's Home Page

<http://www.umich.edu/~lowbrows/>

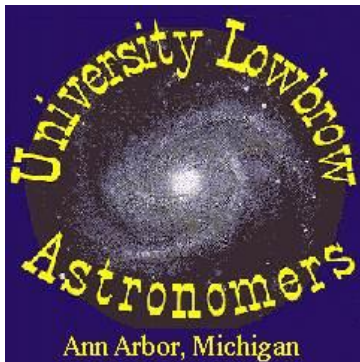
Dave Snyder, webmaster



Spectroscopy on State Street

Color versions of these images will be available to members on the web at www.umich.edu/~lowbrows/

Photo by John Ryan



UNIVERSITY LOWBROW
ASTRONOMERS
3684 Middleton Drive
Ann Arbor, Michigan 48105

Lowbrow's WWW Home Page:
www.umich.edu/~lowbrows/

Check your membership expiration date on the mailing label.