Planetarium Operations

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Program Philosophy

A planetarium is sometimes a rose by another name. Today, planetariums may be referred to as “star theatres” “cyber domes” and “multimedia facilities.” These new, high-tech names are often meant to discern new, high-tech planetariums from older facilities that many community members recall. Choosing the terminology for a new facility is yet another decision to be made by the planners, but regardless of the name chosen, the facility requires a mission statement.

A mission statement outlines the goals of the planetarium. These goals are often drafted to be consistent with or complimentary to the mission statement of the parent institution (e.g. a museum or university where the planetarium is located). The mission statement goals are ongoing, long-term goals.

Before creating a mission statement, several decisions must be made concerning use of the new facility. Regarding the use of the space:

Will the facility be used solely for astronomy—or science—education?
Will the facility be used for cultural/artistic presentations?
Will the facility be used as a multi-media center?

The community, or target audience, that the new facility will serve must also be identified. The following groups should be considered when designing the mission statement for a new planetarium:

- K–12 school groups
- College students
- Senior citizens
- Tourists
- Scouting groups
- Families
- Teenagers
- Businesses
- Non-profit groups
- Local media
- Birthday Parties

The mission statement is often drafted as a list of key goals for the planetarium. Some of the goals may be stated specifically, and some may be general. Taken together, the list of goals outlines the overall philosophy that will guide the operation of the new facility. The following are excerpts from a mission statement:

> *"Assist area schools as an educational resource enhancing their astronomy and space related teaching activities."*
> *"Serve as a community resource for astronomy and space education for community and civic organizations, the general public, and the media."*
> *"Provide a site for business and community organizations to host conferences requiring high technology equipment."*
> *"Encourage the ability to think creatively and critically, and to arrive at sound premises and reasonable conclusions that may become a part of each person's value system."*

Staffing

The size of the planetarium staff is determined by the magnitude of the mission for the new planetarium. That is, how the facility will be used and the size of the community to be served determine the amount and type of programming necessary. This, in turn, affects the amount of staff needed to accomplish the goals for the new facility.

Many different jobs must be done within each planetarium. Some planetariums operate effectively with one person performing all or nearly all of these jobs. Other planetariums require many full-time people to accomplish their missions. Project planners will gain invaluable advice on staffing needs for their new planetarium by interviewing a variety of experienced members of the planetarium community. Table 1 includes a list of "typical" positions found in a planetarium and "typical" qualifications.

Typical Position	**Typical Qualification**
Planetarium Director or Manager	M.S. or Ph.D. in astronomy or a related field; often 2 or more years experience in planetarium
Production Manager	B.S. or better in astronomy or a related field; often programming experience required
Technician	B.S. in electrical/mechanical engineering or lots of fabrication/design experience
Show Presenters, Ushers and Box Office Staff	Confident public speaker and friendly personality
Office Staff	Varies

Table 1. Typical planetarium positions.

While Table 1 lists typical positions in a planetarium, it does not exhaustively list the different jobs that must be done at a planetarium. Knowledge of typical planetarium positions is not enough to determine the staffing needs of a new facility. The most important task of the project planners with regard to staffing is to consider the jobs that must be done once the facility is open.

Planetarium Jobs

The specific title for the person who will lead the operation of the planetarium often depends on the existing organization of the parent institution. Whether the title is “director” or “manager,” this position is typically responsible for performing or overseeing all planetarium operations, including the tasks listed below. Responsibilities may be assigned to particular planetarium staff depending on the staff person's particular skills and inclinations.

Planetarium duties common to MOST planetariums:

- Create an annual operating budget
- Staff recruitment, training and supervision
- Acquiring, developing and producing planetarium productions
  - –Photography
  - –Printing/Graphic Arts
  - –Programming and Installation
  - –Script writing/editing
- Maintenance of facility
  - –Maintenance of star projector
  - –Repair and replacement of old equipment
  - –Creation of special effects
- Scheduling and developing programs
  - –Establishing schedules for show presentations
  - –Partnering with outside organizations (e.g. Girl Scouts)
  - –Creating and overseeing special programs
- Maintaining accurate records
- Maintaining memberships in professional organizations, attending conferences

Additional jobs performed within SOME planetariums:

- PR & Marketing
  - –Maintain a presence in the community (e.g. through ads)
  - –Attract sponsors and business through marketing
- Management of galleries/display areas
  - –Creation and installation of science displays
- Box office operations
  - –Hiring and training box office staff
  - –Maintenance of box office equipment

Project planners need to consider if existing institutional people will assist with these areas of operation. Many museums and science centers assume the responsibility for public relations and marketing the planetarium. Some of these same institutions have departments that handle the sale of planetarium tickets and booking of the facility by groups. Planetariums that are built on school campuses often benefit by the on-site existence of technical facilities, such as darkrooms, and on-site experts which may assist with computer support and creation of original scripts and artwork for productions.

Key professional planetarium staff, e.g. the planetarium director or manager, are often located through the International Planetarium Society and related sources. Electronic mailing lists and professional publications are excellent ways to advertise a position to the large community. The most active and well used planetarium e-mail list is "Dome-L."

To subscribe to Dome-L go to http://planetarium.net/dome-l/ and follow the instructions.

Other full-time positions within the planetarium are usually filled by recruiting efforts of the director or manager. The director or manager will often fill part-time positions with student assistants and other members of the community.

Work Areas and Storage

Many planetariums built today replace planetariums built 30 or more years ago. The new planetariums must be designed with future needs in mind: if the new planetarium is to last for the next 30 years, careful consideration must be made not only for technical changes/improvements but also for work areas and storage.

The director and other staff need ample space to complete their duties. A private office should be created for the director of the planetarium. Keeping in mind that the planetarium is really a business, professional impressions are best made without nearby distractions from other employees doing their jobs. Also, effective staff management requires a quiet and private place for one-on-one interaction. The director's office should be equipped with a desk, phone, computer, printer, and plenty of shelves and file storage.

Regardless of the number of full-time staff, a production area is required for the planetarium. The production area should have:

- slide table (also called a *light table*) to organize, build and preview slides
- generous-size work tables and/or counters
- drawers and shelf storage
- tools, including hand tools, small shop tools, electronics bench tools, etc.
- spare parts
- light bulbs/lamps for projectors
- production media (laser disks, tapes, film)
- manuals
- props
- common office tools and supplies (scissors, tape, paper cutter, etc.)

A photographic darkroom and a small machine shop are good to have in a planetarium production area, if there is need and if space and funds permit.

Projectors and other effects will be created and repaired in the production room. In today's planetariums, many computers are being used to generate graphics; these computers also need to be housed in or near the production area.

For support staff, an area should be planned with a desk, computer, phone and access to a printer. Depending on the size of the operation, a full-time office worker or equivalent may be needed to handle reservations (of school groups and other organizations who book planetarium presentations), send confirmation letters and act as receptionist. Some institutions may handle the reservations of the planetarium. In some cases, the size of the operation will determine this. At one two-year university, the university receptionist handled the reservations for the 40-seat planetarium that booked only a few school groups a week. After a new planetarium was built, the demand for

school bookings rose dramatically, and the new planetarium assumed responsibility for booking groups.

If the planetarium is to handle box office operations, a small ticket office near the entrance to the planetarium should be provided. This ticket office will need at least a phone (required for safety consideration) and a cash drawer, possibly a computer, depending on what ticket system is desired (see "Options for ticket systems" under the "Public Programs" in the next section on "Programming and Scheduling"). Make sure to provide a means to neatly display prices and announcements.

Planetariums that have adjacent science galleries or display areas will accumulate reusable displays, tools and other materials (e.g. spare light bulbs and parts, cleaning supplies) used in the display areas. These materials will require storage space. Certain items, such as film and many other media that will deteriorate in hot, damp or humid conditions, require storage space that has a controlled climate.

All areas should be designed with ample area for the activities that will occur in them. Plenty of outlets and network jacks are a necessity in today's "high-tech" planetarium.

Programming and Scheduling

A variety of programs may be created by the planetarium and offered to various members of the community. The planetarium may present shows for the public, school groups and private groups (including businesses and other organized groups). The planetarium may also create a variety of special projects, including a summer camp and stargazing parties co-sponsored with a local astronomy club.

Public Programs

Planetariums can offer a regular schedule of presentations for the general public. Some planetariums present one (or less) presentation a week; others may present multiple shows seven days a week. The mission statement and the size of the community to be served will determine the number of shows that a planetarium will offer on a regular basis.

The shows that will be presented to the public must address the community needs. *How will you choose programs and topics?*

For public shows, if admission is to be charged, a system for collecting admission charges must be implemented.

Options for ticket systems:

1. Pre-printed tickets. Small planetariums (40 or fewer seats) that will present few public shows may be able to sell pre-print tickets without a computer program.
2. Ticket computer. Cost analysis may show that, over time, the cost of a ticket computer (several thousand dollars) is cheaper than the cost of pre-print tickets that are not sold and literally thrown away. In addition to a ticket computer and printer, you can add a network connection to allow the electronic database from a ticketing program to be transferred and archived as a record of attendance and transactions.
3. Reusable tickets. This is more ecological and cost-effective than preprinted "throw-away tickets." You can use tokens, e.g. poker chips, with generic show times printed on them--a different color for each show time, for easy identification. The usher/ticket

taker puts the tokens in a tray that is arranged for easy counting of stacks of tickets. The trays are returned to the box office for reuse.

Also, the schedule for public shows must be communicated to the intended audience through flyers and newspaper ads, for example.

School Program

Special programs may be created for K–12 school groups. These programs may reflect local, state and federal standards for astronomy and science education. Local school districts are good sources for these standards.

Direct-mailing a description of your school program to schools in your area is a good start to building a school client base. You might choose to build your mailing list by directly mailing to teachers who bring their classes.

Teachers will appreciate written confirmation of their reservations as well as a list of rules for groups to follow when visiting your facility. If admission is to be charged, a method for collecting the admission charge must be implemented.

Facility Rental Program

Private groups (such as church groups, tour groups, birthday party groups, and scouts) may inquire about renting the planetarium for a private presentation of a planetarium show, particularly if the number of weekly public shows is limited due to the size of your community. Renting the facility for private show presentations or for use as a multi-media facility requires careful reservation management. Rental of the planetarium as a multi-media facility also requires trained staff to prepare for the special event and be on hand to operate the planetarium controls, as needed. Rental rates should be set accordingly to cover additional costs of these events.

Written confirmation of reservations and rentals is a good business practice.

Special Projects

The planetarium may offer a variety of free and revenue-generating programs in addition to the ones already listed. Planetariums will often offer special topics classes for community members of all ages; topics may include teaching about planets in our solar system, choosing your first telescope, and techniques for photographing an eclipse.

Some planetariums organize special summer camps. Week-long summer camps with a “space” theme can be quite popular among elementary and middle-school aged children.

Planetariums may partner with a local scout organization to present a special program for scouts. These programs may allow the scouts to attend an event at the planetarium that meets all or some of the requirements for a special interest patch or badge.

Star parties and an annual Astronomy Day celebration, co-hosted with a local astronomy club, and an annual birthday celebration are also events the new planetarium may organize.

Scheduling Facility Use

A master calendar is invaluable for organizing all of the uses of the new planetarium.

Ample maintenance time should be scheduled to complete maintenance, programming and training. Some planetariums take one day a week, every week, for this so-called "dark time," when shows are not scheduled or presented. Other planetariums may only have a few days a year closed to the public. A schedule that allows some flexibility is best.

Production

Original and Purchased Shows

All planetariums have on-site production, which minimally consists of installing a purchased planetarium show. The extent of on-site production should be considered in the planning stages of the planetarium.

> *Will most of your planetarium shows be purchased shows?*
> *Will most of your planetarium shows be original "in-house" productions?*

Original, or "in-house," full-length productions require many hours of work and long production time to complete. A concept and script must be created for each in-house production. In-house productions also may require original artwork, computer animation, soundtracks and additional equipment (such as a mixing board, cameras, computer software to manipulate images).

Purchased shows require less production than an original show. Shows are available with high production quality; some of these shows include original computer animation, multiple-channel soundtracks and even famous narrators. These shows are more economical to purchase than reinvent. Purchased shows require review and adaptation for the best presentation in your theatre configuration. Planetariums with automation systems need to program a run-time program to control the show at each presentation. In some cases, changes or improvements to the original show are required during installation. For example, since developments occur daily in the fields of astronomy and physics, it is common for purchased planetarium shows to need updating to include the most recent images or information about a topic.

Style of Presentation

The style of planetarium presentations may be unique to each theatre, or variable within each theater. Many purchased planetarium shows come with a complete recorded soundtrack and require little audience interaction with a presenter. Other planetarium shows may be presented live, with various degrees of audience participation or audience interaction. Some planetariums are built with push-button audience interactive systems that invite a blend of live and recorded presentation.

In some sense, an original production is seen at almost every planetarium: the standard "sky show." These shows require the most knowledgeable presenters—familiar with the science and the equipment, as well as having excellent public speaking skills. In a typical live sky show, the presenter narrates a tour of the current night sky, manipulating

the planetarium controls manually throughout the show. For an audience participation version, teach the audience how to use sky maps to find constellations on their own.

Even when recorded shows are being presented, many planetariums will include a live presentation at the beginning, middle or end of the show. Live introductions are best done in front of the audience, while live narration in the middle of the show does not require the presenter to be in front of the audience. During a show, though, the presenter should be able to clearly see the planetarium dome while manipulating controls. Construction and design of the control systems and the chamber should be done with this in mind.

Budget

When creating a budget for a new planetarium, a few questions should be considered:

Is the planetarium self-supporting?
Will the budget come directly from planetarium revenue?
Will the budget be allocated by the host institution?

Once those questions are answered, more follow.

What are the sources of revenue for the planetarium?

Besides the parent institution, the following may be considered as possible sources of operating revenue:

- ticket sales/public shows
- donations
- special programs
- school groups
- endowments
- membership program
- facility rentals
- sponsors for programs
- gift shop

Admission charges for public shows (including discounts for children and seniors), school shows and rental charges depend on the expected attendance of the planetarium and the operating expenses that must be covered by these sources of revenue.

Donations, endowments and sponsors for specific shows or programs require active marketing and a persistent fund-raising strategy. Membership programs require planning to determine the benefits to members and management to maintain accurate records and send renewal notices.

Gift shops may infuse revenue into the operating budget of the planetarium. A generous amount of capital is necessary to stock the gift shop, and the gift shop should be considered when designing the overall layout of the planetarium. Location, size and staffing of the gift shop should be considered when the planetarium is being designed.

Included in Table 2 is a checklist of costs for running a planetarium.

Staff Maintenance of equipment Annual Periodic Emergency Photographic supplies Fresh film and chemicals 35mm lithographic film Slide mounts Opaquing fluids Archive materials Archive-quality (non-gassing) binders Archive-quality (non-gassing) slide pages Music supplies CDs and tapes Music service Splicing and leader tape for reel-to-reel Membership fees for conferences Reference Books Office Supplies Staples, printer ribbons, paper, disks, paper clips, tape & glue, pens pencils, stationery, postage, copying Displays Ink-jet prints for gallery displays Frames, titles, props	Light bulbs for projectors Supplies for special effects Gears, motors, bulbs, lenses, mirrors, wire, metal, wood, clear plastic sheets, plugs and connectors, electronic parts Art materials Paints and inks Brushes and pens Transfer letters Templates Illustration board Paper materials Non-flammable cloth materials Production tapes Magazine subscriptions Conference costs Staff time Printing Hire of rooms/equipment Batteries (rechargeable/replacements) Show Production Fees—scriptwriter, narrator Studio—audio and video Show kit production

Table 2. Planetarium operation expense items.

Public Relations and Marketing

Planetariums that will handle their own public relations and marketing require extra staffing and equipment considerations. Flyers to advertise the show schedule and other programs can be created using a word processor; however, a professional-quality program is necessary to create camera-ready ads and artwork for newspapers and magazines. Such a program is also useful for creating a host of marketing resources. The amount of time necessary to handle the sales calls and creation of ads is an important consideration when planning the staffing of the planetarium.

A valuable built-in marketing tool is the planetarium dome itself. While audiences are waiting for a show to begin, other programs can be promoted on the dome.

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