Applying for jobs and fellowships
IGPP poll of time taken to review a paper:

“Well, that of course depends on the length and content of the paper. For short papers … without much math, I’d estimate 2 - 6 hours. For extensive papers (~10 or more pages, with lots of data and math), I could take 15 to 20 hours.”

“An obviously terrible paper usually takes very little time. About 2 hours including the review write-up. A more standard length paper with equations takes several days. (the above) estimate of 15- 20 hours seems about right.”

“Way too long. Is that an available option? On occasion the review has been comparable length to the paper.”

“(it) might be less than an hour, or more than a couple of days”

“4h, on average”

“I would say something between 8 and 40 hours"

“About 4-5 hours.”

“I would use two days as a number as long as the paper itself is well-written.”
IGPP poll of time taken to review a paper:

“It ranges depending on the length and state of the paper of course, but I would say 6-10 hours”

“A fantastic paper, lucidly written and perfectly evidenced, would be 3 hours. Most take 6~8 hours of solid work, with the worst being those that are poorly written and badly organized, but important. That’s more like 12 hours.”

“Session 1 a quick read - 1 hour. Session 2 is usually a week later with a more through read and draft review - 3 hours. Session 3 is a next-day cleaning up the review - 1 hour.”

“2 hours for a bad paper, 8-12 hours for a good one”

“I’d guess 2 hours is the median time, but the range is huge, from 30 minutes to 8 hours.”
This graphical presentation assumes a 6—10 hour day, and a range of half to twice for a single number estimate:
Applying for jobs and fellowships
Applying for PhD fellowships:

NSF has graduate fellowships:

The purpose of the NSF Graduate Research Fellowship Program (GRFP) is to help ensure the vitality and diversity of the scientific and engineering workforce in the United States. The program recognizes and supports outstanding graduate students who are pursuing research-based master's and doctoral degrees in fields within NSF's mission. The GRFP provides three years of support for the graduate education of individuals who have demonstrated their potential for significant achievements in science and engineering research. The ranks of NSF Fellows include individuals who have made transformative breakthroughs in science and engineering research and have become leaders in their chosen careers and Nobel laureates.

Applicants must be citizens or residents. Applications consist of Personal Profile, Education and Work Experience, Planned Graduate Program, Personal Statement, Previous Research Experience, Proposed Plan of Research, and References, each with a 2-page limit. Official transcripts and 3 letters of recommendation are also required. (Must have no more than 12 months graduate training as of August 1.)

The odds are not bad: in 2013 2,000 awards were made.
Applying for postdocs:

Timing is generally a big issue with postdoc applications, especially if there is no funding to continue directly after a PhD at the same institution.

Some universities have institutional postdocs advertised once a year.

Some groups/PIs will advertise for a postdoc when money becomes available.

Commonly, having specialized to the point of getting a PhD and having been to meetings etc., there will be a relatively small number of groups/PIs you will be interested in working with. With any luck, they will be interested in having you work with them. However, it can take up to a year to generate postdoc funding, so start the dialogue early in your final year.
Applying for postdoctoral fellowships:

NSF and some non-profits have competitive fellowships that can be taken up at an institution of choice:

The Division of Earth Sciences (EAR) awards Postdoctoral Fellowships to highly qualified investigators within 3 years of obtaining their PhD to carry out an integrated program of independent research and education. The research and education plans of each fellowship must address scientific questions within the scope of EAR disciplines. The program supports researchers for a period of up to 2 years with fellowships that can be taken to the institution or national facility of their choice. The program is intended to recognize beginning investigators of significant potential, and provide them with experience in research and education that will establish them in leadership positions in the Earth Sciences community. Because the fellowships are offered only to postdoctoral scientists early in their career, doctoral advisors are encouraged to discuss the availability of EAR fellowships with their graduate students early in their doctoral programs. Fellowships are awards to individuals, not institutions, and are administered by the Fellows.

Applicants (NSF) must be citizens or residents. The proposal looks like a standard NSF proposal, but has a letter of commitment from the host institution and sponsoring scientist in the supplementary docs. The host institution cannot be the one where the PhD was obtained.
Applying for postdoctoral fellowships:

Fellowships exist at government labs etc. (e.g. USGS, National Laboratories). Like all things government, there are deadlines and prescribed formats for the applications. Again, you will need to identify and coordinate with someone who you will work with and a well-articulated research plan.
After the postdoc…

You should be starting to think about the long game as you go into a postdoc.
Applying for faculty positions:

These are almost always advertised positions.

The level (assistant, full, chair, etc.) should probably be taken seriously, but don’t be too constrained by the description. If you would like to work in the university in question, and your application is at all credible, go for it. The applicant pool that fits the description may be weak, and departments are often loath to lose a position by not making an appointment. If the deadline is passed, contact the university and see if they are still taking files for consideration - again, if the pool is weak they will keep the job open.

In addition to your research creds, faculty positions will require teaching experience and a teaching plan and nowadays almost always request a diversity statement.
The teaching statement:

If you’ve had the opportunity to help teach a class, that’s great, but the search committee will understand that it is hard for young people to get teaching experience. But talk about your TA experience, or work with mentoring junior students, and have a teaching philosophy based on your own (probably recent) experience on the other side of the podium.

See the article on teaching statements linked to the web site. Key points are to show a commitment to teaching, do your homework and talk about which existing classes you could teach (or help teach), and what new classes you might develop. Show a willingness to learn and develop as a teacher, and keep the proposal in line with what you can reasonably expect to do while establishing a new career.
The diversity statement:

UCSD policy states that a candidate's race, gender, ethnicity or other personal characteristics may not be considered in the evaluation of academic appointments. However, search committees can consider past or proposed contributions to diversity as part of the overall review process.

A diversity statement should describe your past experience, activities and future plans to advance diversity, equity and inclusion. Describe any past experience or background that has made you aware of challenges faced by historically underrepresented populations.

Mentoring Activities: If you mentored people from underrepresented groups, describe the specific context and objective of the mentoring.

Committee Service: If you served on a committee or board that focused on diversity, equity, climate and/or inclusion, describe that.

Research Activities: If any of your past research effort specifically contributed to diversity, equity and inclusion, describe the work and any impact it has had on the university or broader community.
The diversity statement …

Some faculty candidates may not have substantial past activities. If that is the case, focus on future plans in your statement.

The first step is to gather information on activities you would like to pursue. You may consider but are not restricted to current or ongoing activities on the campus you are applying to. For each proposed activity you include, describe the role you envision having and what you would like to accomplish in the next two to five years. Who would you like to engage in your efforts, and how would you plan to engage them? Be realistic in terms of your effort and time commitment.

Examples include service that increases the participation of historically under-represented groups, teaching and/or mentoring students who are under-represented or under-served in higher education, development or use of pedagogies that address different learning styles and/or learning disabilities, research that contributes to understanding the barriers facing women and under-represented minorities in higher education.

(The above material has been drawn from UCSD’s Center for Faculty Diversity and Inclusion. This web site has additional resources to help with diversity statements.)
References:

You will need to name 3-5 outside references. One of these will likely be your PhD/Postdoc advisor. He/she will be seen to be biased, but it looks strange if this letter is missing.

The others should be the most high ranking, most independent people you can find who know about you and your work and are likely to write you a good letter. You should always ask them ahead of time if it is OK to use them as a reference (for a number of reasons, besides courtesy).
The workflow for a Faculty appointment:

1. **Section/Curricular Group** proposes a search area.
2. **SIO Director** approves the search/level.
3. **Department Chair** appoints a search committee.
4. **50-100 applicants** are invited to visit.
5. **Candidates** are chosen to visit.
6. **Phone interviews** are conducted on the short list.
7. **Section/Curricular Group** votes to appoint a candidate.
8. **SIO Faculty** negotiates and makes the offer.
9. **EVC Acad. Aff.** makes the final offer.

The process begins with the section/curricular group proposing a search area. The SIO Director approves the search/level, and the Department Chair appoints a search committee. Once the search committee selects a short list of candidates from the 50-100 applicants, phone interviews are conducted. The candidates are then chosen to visit, and the section/curricular group votes to appoint a candidate. The SIO Faculty negotiates and makes the offer, and EVC Acad. Aff. makes the final offer.
Applying for other positions.

There are many opportunities for science careers in industry, government, and NGOs. Large companies will advertise, or recruit through the internship process. Most companies will hire, even prefer to hire, directly from a PhD or Masters degree.

Many companies (and some government labs) will recruit at meetings such as AGU and SEG. Some companies visit Scripps.

Industry has very much more flexibility in hiring than universities do. The biggest trick is establishing a contact at the right level within companies. Again, start early. Go to meetings and introduce yourself. Ask your mentors if they know people in the appropriate industries.
Application letters.

Your application letter should clearly expound on

- your skills and experience to date
- your research plans for the future (if a research position)
- your teaching philosophy and plans (Faculty positions)
- your interest in promoting diversity at University/Organization X
- why University/Organization X is the right place for you

Again, do your homework and find out which existing courses you might teach (for a teaching position) and which groups/people you might collaborate with.

The letter needs to exhibit confidence without coming across as arrogant. Appropriate length is an interesting question - personally we prefer concise letters to long rambles (the committee might be reading 50-100+), but one-pagers which assume the vitae explains it all are a mistake. The article linked to the web page says one page, but for faculty/postdoc positions 2-5 is probably more normal.
The interview.

You may be interviewed by phone, or in person.

Again, exhibit confidence without coming across as arrogant.

Prepare answers to the obvious questions. Here are some examples from recent faculty searches at Scripps:

- What are you currently working on, and how did you come to work on it?
- Where do you see your research going for the next N years, for your selected value of N?
- Where do you see your funding coming from?
- What attracts you to working at SIO?
- What courses were most useful for your graduate training? Would you like to teach something like that here?
- What resources do you expect to need from SIO?
- Do you have questions for us?
The interview...

The second set:

- Why do you want to come to SIO/be a professor at SIO?
- Who do you picture yourself collaborating with at SIO?
- How large a group would you see yourself working in (how many students and postdocs would you like to advise)?
- How do you feel about teaching?
- What courses would you teach?
- What sorts of things would you ask for in your start-up?
- What is the funding status like in your field?
- Can you imagine yourself settling long-term in San Diego?
- Do you have any questions for us?

Note the “questions for us”. Be prepared for this, it is a chance to set yourself apart from everyone else.
The public lecture.

Many of you will have reasonable experience at public speaking through meetings, internal seminars, group meetings, exams, etc., so this should not be a huge hurdle for you, but...

You will be talking to a broader audience than usual. The trick is to balance making things simple enough for those outside your field to understand you (and enjoy the talk), while displaying technical competence to those closer to your work.

You also need to make the case that YOUR speciality is important and has a future. Don’t talk about your teaching plans, but consider finishing your talk with your future research plans (briefly!).

Above all, keep to time! Questions are part of testing your competence, and people will be frustrated if you don’t leave time. Also, going on past time sends the message that you think you are more important than your audience.
How to give a truly awful talk:

Waste the first few minutes of a short presentation going over a table of contents.

Make the axis annotations too small to possibly see.

Put lots of words on your slide and then read them aloud.

Use lots of acronyms and assume that your audience understands them.

Use a 0.5 pt line weight and hope that the projector will make it big enough to be seen.

It is most effective to turn your back on the audience and microphone to look at your own slides.

(from notes taken during the 2012 EM Workshop in Darwin)
At the end of the day...

... hiring is a kind of popularity contest. If you’ve made it the point of giving a public lecture, one might assume that your technical competence meets the minimum standards for the position. Now you need to convince people that they want to work with you, or at least be around you, for the rest of your respective careers.

You will probably be asked to meet with students. Charm them, relate to them, tell them you think students are important. They have a say in the recruitment process.

You will likely visit other research groups. Show an interest in their work.
If you get an offer.

Be happy. Pop the Champagne. Then remember that it’s not over yet...

Now is the time to negotiate start date, salary, level, startup, space, access to facilities, teaching loads, maybe even a position for a spouse. Once you sign you lose a huge advantage in these discussions. Remember, the institution has invested a lot in getting to this point, and wants to make the recruitment happen and for you to get the resources you need to be a success.

But don’t be greedy. It will get you off on a bad footing.